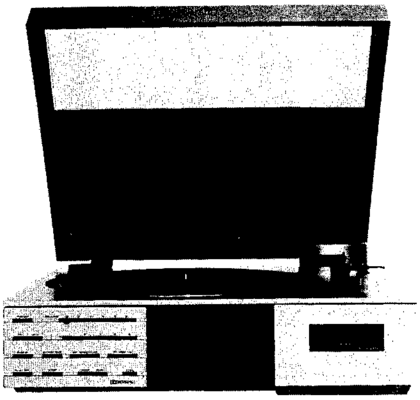
PIONEER®

Service Manual

CIRCUIT & MECHANISM DESCRIPTIONS REPAIR & ADJUSTMENTS



ORDER NO.
ARP-036-0

STEREO CASSETTE DISC RECEIVER

MX-80

- This service manual is applicable to the S type.
- Ce manuel d'instruction se refère au mode de réglage, en français.
- Este manual de servicio trata del método de ajuste escrito en esppañol.

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1. SPECIFICATIONS

Amplifier Section

Continuous Average Power Output is 25 watts* per channel, min., at 8 ohms from 40 Hertz to 20,000 Hertz with no more than 0.5% total harmonic distortion.

Total Harmonic Distortion (40Hertz to 20,000hertz, 8 ohms, from TV/AUX)	
Continuous rated power output	No more than 0.5%
Intermodulation Distortion (50Hertz: 7,000Hertz 4:1, 8 ohms, from TV/AUX)	
Continuous rated power output	No more than 0.5%
Damping Factor (1kHz, 8 ohms)	30
Input (Sensitivity/Impedance)	
PHONO	2.5mV/50kilohms
MIC	2.5mV/50kilohms
TV/AUX	150mV/50kilohms
Output	
SPEAKERS	
Frequency Response	
PHONO (RIAA Equalization)	30Hz to 15,000Hz ±1dB
TV/AUX	15Hz to 60,000Hz$^{+0}_{-3}$dB
Tone Control	
LOW BOOST	+7dB (100Hz)
HIGH BOOST	+7dB (10kHz)
Hum and Noise (IHF, short-circuited, A network)	
PHONO	70dB
TV/AUX	91dB
MIC	69dB

FM Tuner Section

Frequency Range	87.5MHz to 108MHz
50dB Quieting Sensitivity	
Stereo	38dBf (21.9µV 75 ohms)
Signal-to-Noise Ratio (at 65dBf)	
Mono	74dB
Stereo	68dB
Distortion (at 65dBf)	
Mono (1kHz)	0.5%
Stereo (1kHz)	0.5%
Capture Ratio	1.0dB
Alternate Channel Selectivity (400kHz)	60dB
Stereo Separation (1kHz)	40dB
Frequency Response	40Hz to 16,000Hz ±1dB
Spurious Response Ratio	70dB
Image Response Ratio	50dB
IF Response Ratio	80dB
AM Suppression Ratio	50dB
Antenna Input	300 ohms balanced, 75 ohms unbalanced

AM Tuner Section

Frequency Range	525 kHz to 1,602kHz (9kHz step) 520kHz to 1,610kHz (10kHz step)
Sensitivity	
IHF, ferrite antenna	300µV/m
IHF, external antenna	30µV
Selectivity	20dB
Signal-to-Noise Ratio	47dB
Image Response Ratio	40dB
IF Response Ratio	40dB
Antenna	Ferrite loostick antenna

Tape Deck Section

System	Compact cassette, 2-channel stereo
Motor	DC servo motor x 1
Heads	"Hard Permalloy" Recording/Playback head x 1 "Ferrite" Erasing head x 1
Fast Winding Time	Approximately 90 seconds (C-60 tape)
Wow and Flutter	No more than 0.06% (WRMS)
Frequency Response	
Metal tape	40Hz to 15,000Hz
Chromium dioxide tape	40Hz to 14,000Hz
Normal tape	40Hz to 13,000Hz
Signal-to-Noise Ratio	
Dolby NR OFF	50dB
Dolby NR ON	58dB

Turntable Section

Drive system	Belt drive
Motor	DC servo motor
Turntable	300mm diam. aluminum alloy die-cast
Tone arm	220mm straight pipe arm
Cartridge	MM (moving magnet) type Stylus: PN-110/II
Speeds	33-1/3 and 45 rpm
Wow and Flutter	No more than 0.08% (WRMS)

Miscellaneous

Power Requirements	AC 110/120/220/240V (switchable), 50/60Hz
Power Consumption	64W
Dimensions	420(W) x 148(H) x 395(D)mm (max.) 16-9/16(W) x 5-13/16(H) x 15-9/16(D) in
Weight (without package)	10.5kg (23lb 2oz)

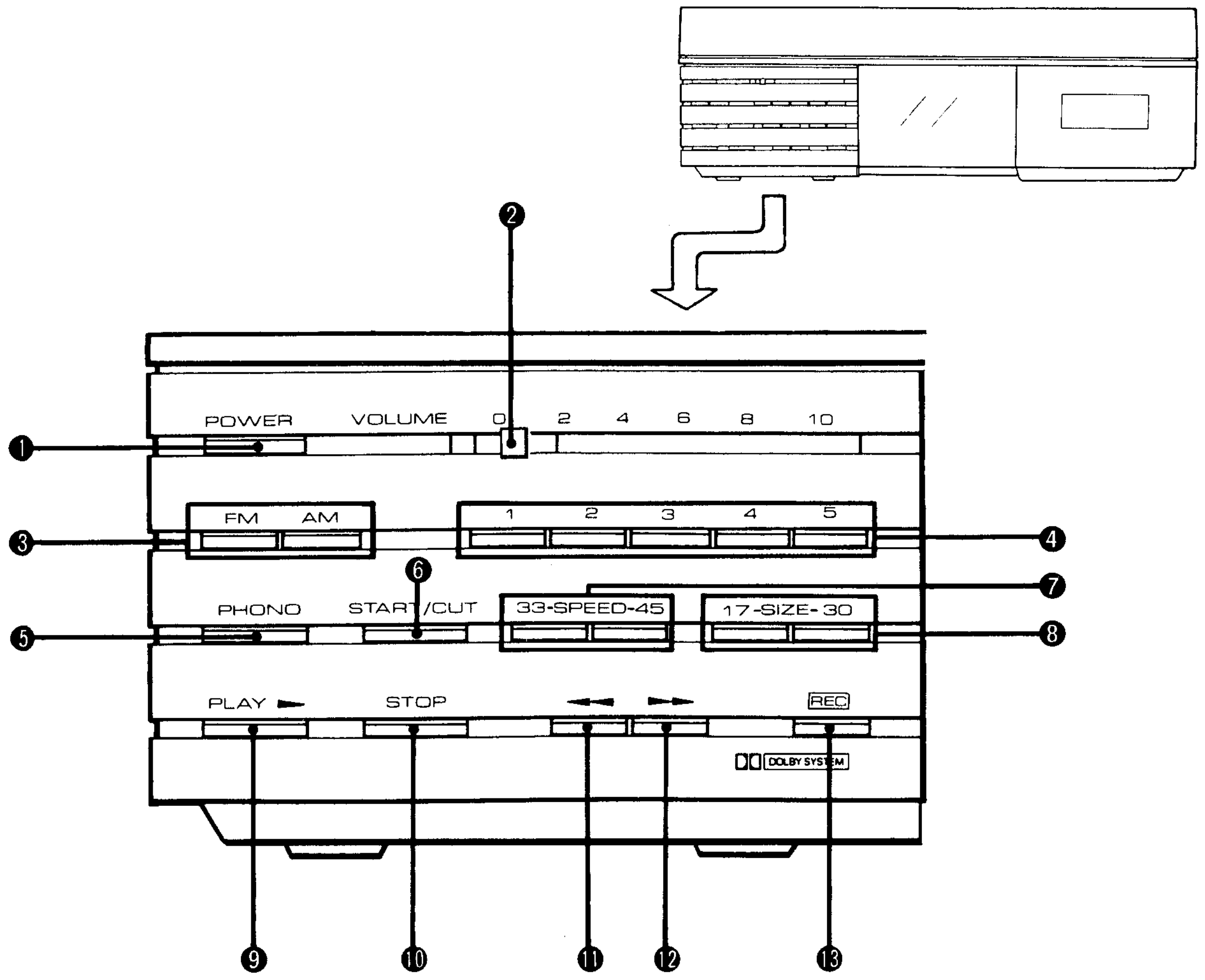
Furnished Parts

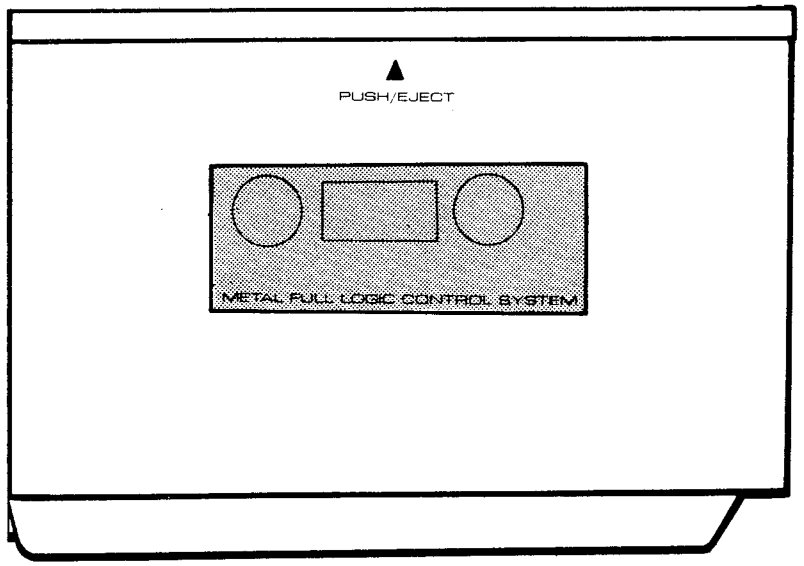
FM T-type Antenna	1
EP Adaptor	1
Operating Instructions	1

**Measured pursuant to the Federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifier.*

NOTE:
Specifications and design subject to possible modification without notice.

2. FRONT PANEL FACILITIES





CASSETTE DOOR

❶ POWER SWITCH

Power is supplied to the unit when this switch is depressed and the switch lights up red. Power is turned off when the switch is released.

❷ VOLUME CONTROL

When this control is slid toward "10" from the "0" position, the volume of sound from the speakers or through the headphones is increased.

Slide the knob toward "10" from the "0" position

❸ FM, AM TUNER SWITCHES

Depress the FM switch for FM reception; depress the AM switch for AM reception.

❹ PRESET TUNING SWITCHES (1~5)

Each of the 1~5 preset tuning switches can accommodate one FM and one AM station giving a total of 10 stations (5 FM and 5 AM stations) for instant recall. After the stations have been stored in the switches, all you need do to recall the corresponding station is simply depress the switch.

❺ PHONO SWITCH

Depress this when playing records.

❻ START/CUT SWITCH

Depress this switch to start or suspend record play.

- When the switch is depressed, the tonearm automatically moves across to the record and the stylus descends onto the record.
- When the switch is depressed during record play, the stylus rises from the record and the tonearm returns to the arm rest.

NOTES:

- *Before depressing the switch, detach the arm rest clamper and remove the cartridge's stylus cover.*
- *Before depressing the switch, check that the SIZE selector switch is set to the correct position.*

❼ SPEED SELECTOR SWITCHES (33/45)

33: Depress for playing 33-1/3 rpm records.
45: Depress for playing 45 rpm records.

❽ SIZE SELECTOR SWITCHES (17/30)

17: Depress for automatic play of records without a "middle" and other 17 cm records.
30: Depress for automatic play of LP and other 30 cm records.

NOTE:
Play 25 cm records in the manual mode (the headshell is moved across to the record grooves by hand).

❾ PLAY (►) SWITCH

Depress to play back a tape.

❿ STOP SWITCH

Depress this to stop the tape running or stop the recording.

⓫ REWIND (◄◄) SWITCH

Depress to rewind the tape from right to left.

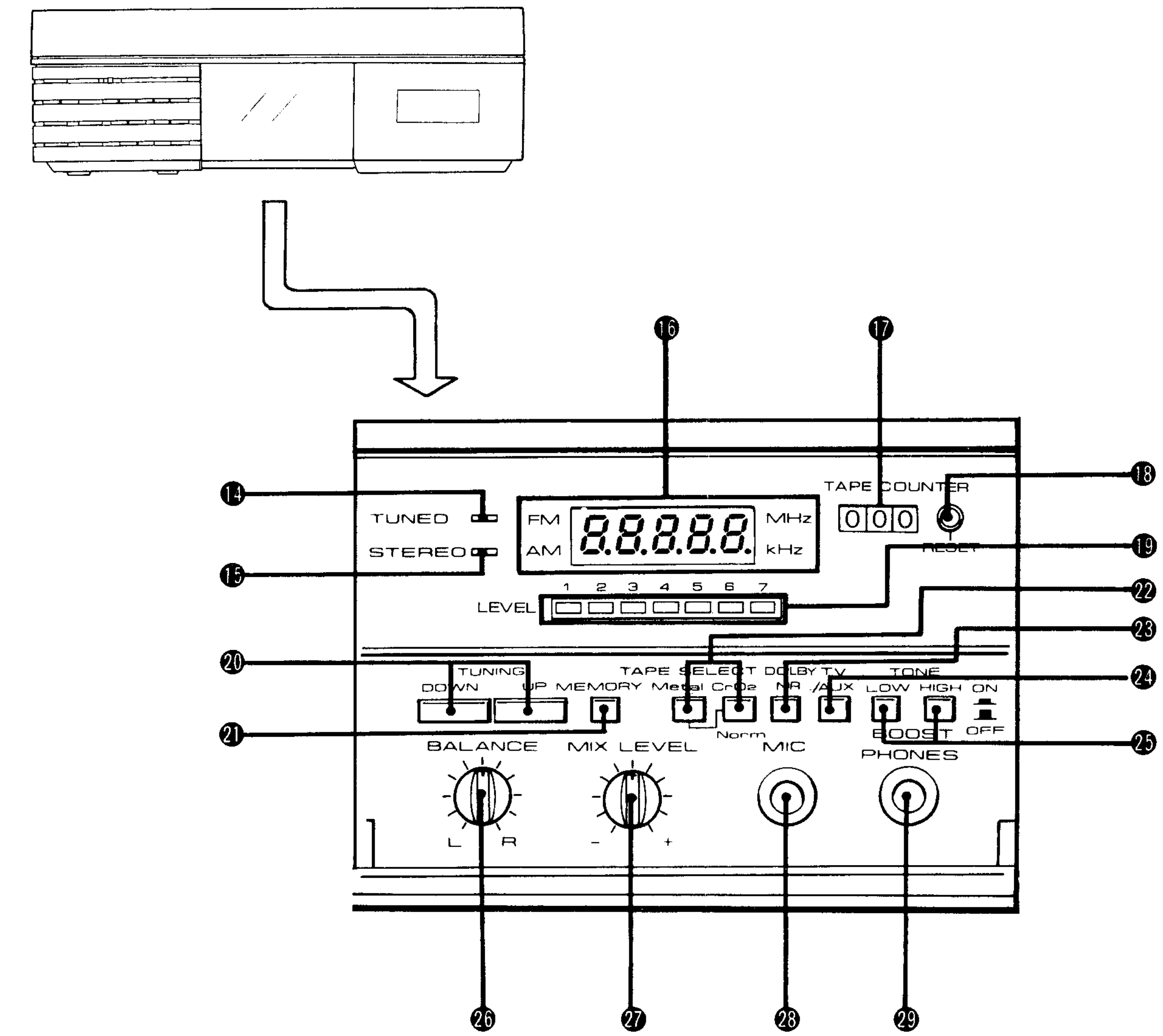
⓬ FAST FORWARD (►►) SWITCH

Depress to fast forward the tape from left to right.

⓭ REC SWITCH

Depress for recording material onto a tape.

NOTE:
The deck will not be set to the recording mode even when this switch has been depressed if the accidental erasure prevention tabs on the cassette tape have been broken out or if the cassette tape has not been loaded.



⑭ TUNED INDICATOR
This lights when a station has been tuned in properly.

⑮ FM STEREO INDICATOR
Lights when an FM stereo broadcast is being received.

⑯ FREQUENCY DISPLAY
Indicates the frequency of the station now tuned in.

⑰ TAPE COUNTER
Indicates the traveling position of the tape in 3 digits.

⑱ RESET SWITCH
Depress to reset the tape counter to "000."

⑲ LEVEL METER
This indicates the signal level of the program source in the form of light. It has nothing to do with the position of the VOLUME control.

⑳ TUNING DOWN, UP SWITCHES
These are used to tune in stations. Depress the UP switch to tune in a station with a higher frequency than that on the frequency display; depress the DOWN switch to tune in a station with a lower frequency.

When the AM CHANNEL STEP switch on the rear panel is set to 10 kHz, the frequency will change in 100 kHz units during FM reception and 10 kHz units during AM reception every time the switch is depressed.

When the same switch is at 9 kHz, the frequency will change in 50 kHz units during FM reception and 9 kHz units during AM reception every time the switch is depressed.

NOTE:
When the AM CHANNEL STEP switch has been set to 9 kHz and the final digit (100 kHz) on the display lights up during FM reception, add another 50 kHz to the frequency displayed.

㉑ MEMORY SWITCH
This is used to store stations into the preset tuning switches.

㉒ TAPE SELECT SWITCHES
Depress the switch that corresponds to the type of cassette you are using.

- Depress "Metal" on the left for metal tapes.
- Depress "CrO_2" on the right for chrome (CrO_2) tapes.
- Release both "Metal" and "CrO_2" for normal tapes.

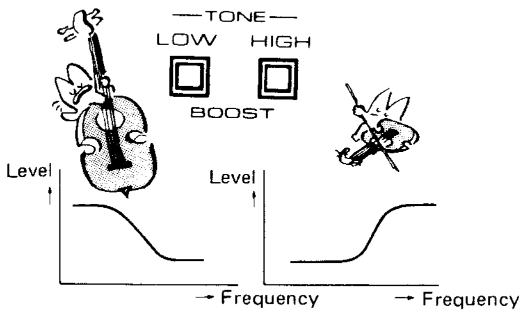
㉓ DOLBY NR* SWITCH
Depress to record a tape with the Dolby noise reduction system or to play back a tape which has been recorded with the Dolby NR system. Otherwise, keep the switch at the released OFF position.

㉔ TV/AUX SWITCH
Depress this when a TV tuner or auxiliary audio component has been connected to the rear panel TV/AUX jacks.

NOTE:
Make sure that this switch has been released when you want to listen to records, broadcasts or tapes.

㉕ TONE SELECTOR SWITCHES
Used to vary the sound quality:

LOW: Depress to emphasize the bass sound.
HIGH: Depress to emphasize the treble sound.



The bass is emphasized. The treble is emphasized.

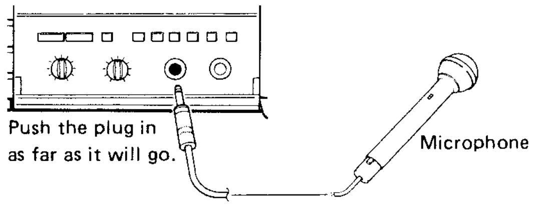
The word "Dolby" and ꟷꟷ are trademark of Dolby Laboratories Licensing Corporation.
Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.

㉖ BALANCE KNOB
Adjusts the left and right channel balance in the sound. It is normally kept at its center click-stop position. When the sound from the left (right) channel appears stronger than the sound from the right (left) channel because of the acoustics of the listening room or positions of the speakers, rotate this knob to the right (left) to achieve a balance in the stereo sound.

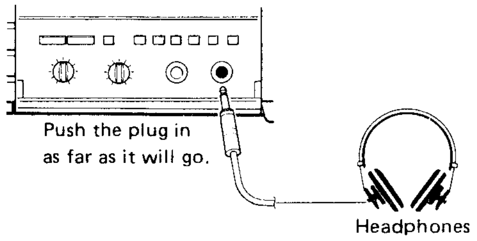
㉗ MIX LEVEL CONTROL
This is used to balance the volume of the program source and microphone volume for mic mixing. The microphone volume increases when the control is rotated toward "+" and it decreases when rotated toward "–". Use the VOLUME control to adjust the overall volume.

㉘ MIC JACK
This is used when a microphone is being employed. The volume of the microphone is adjusted with the MIX LEVEL control. To amplify the microphone volume only, depress the PHONO switch and do not play any records.

NOTE:
Use a microphone with a standard 6 mm diameter plug.



㉙ PHONES JACK
Connect the headphones plug to this jack for use. When the headphones are connected, no sound is heard from the speakers.



3. DISASSEMBLY

Turntable Unit Assembly (Fig. 3-1)

1. Open the hood assembly by about 45° and then straight up.
2. Secure the tonearm in the arm rest. Remove the rubber matting, and release the turntable drive belt from the motor pulley. Then lift the turntable platter up and out.
3. Undo the 7 screws ❶ securing the player unit cabinet.
4. Raise the front of the player unit by a degree sufficient to give access to the internal turntable mechanism.
5. Disconnect the 3 connectors located inside the turntable unit.

Front Grille (Fig. 3-2)

1. Remove the knob (VOLUME) by pulling straight out.
2. Using a small minus screwdriver depress the 2 catches along the top of the front grille and the 2 catches along the bottom.

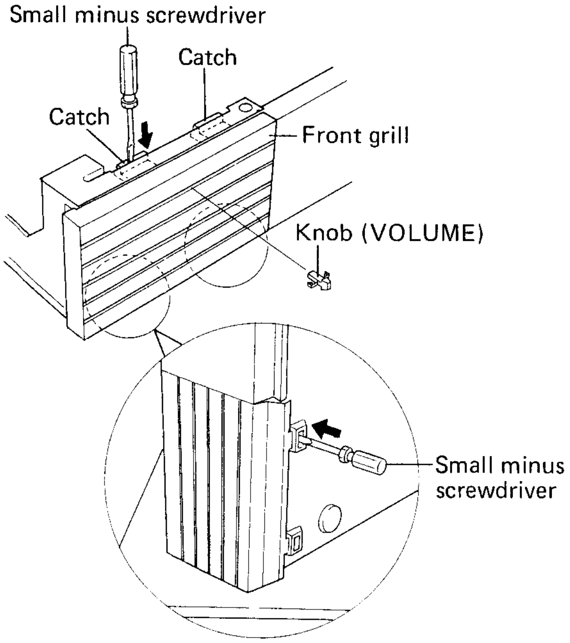

Small minus screwdriver
Catch
Catch
Front grill
Knob (VOLUME)
Small minus screwdriver

Fig. 3-2 Front grill removal

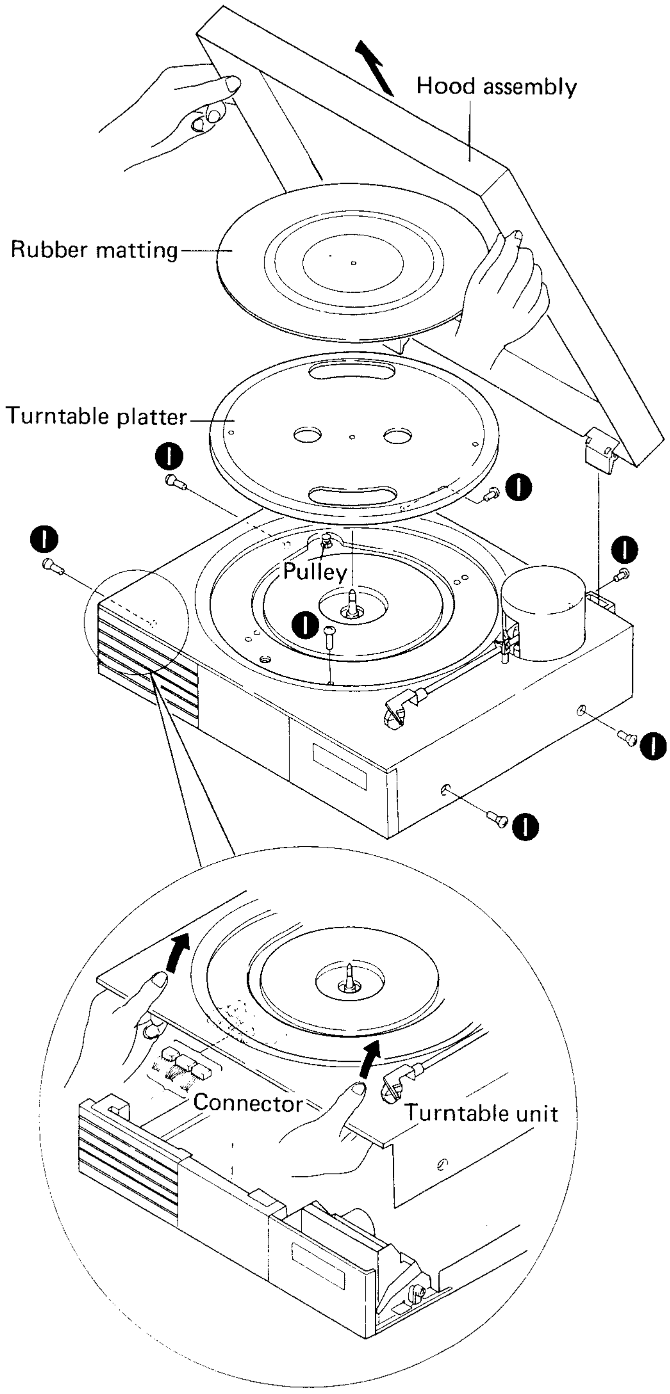

Hood assembly
Rubber matting
Turntable platter
❶
❶
❶
❶
Pulley
❶
❶
❶
Connector
Turntable unit

Fig. 3-1 Turntable unit removal

Sub-Panel Assembly (Fig. 3-3)

1. Remove the acryl cover, counter belt, and the knobs (BALANCE, MIX LEVEL).
2. Undo the 2 screws ❷ and disengage the sub-panel assembly catch (at top left hand corner).
3. Tilt the top of the sub-panel assembly forward (by about 30°) and then lift straight up.

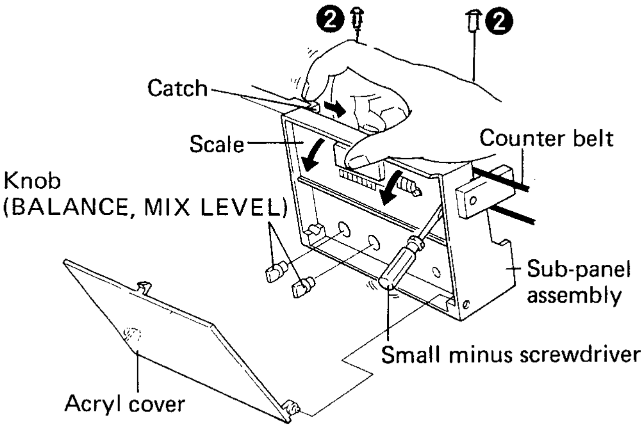

❷
❷
Catch
Scale
Counter belt
Knob
(BALANCE, MIX LEVEL)
Sub-panel assembly
Small minus screwdriver
Acryl cover

Fig. 3-3 Sub-panel assembly removal

Cassette Door Assembly and Dress Plate (Fig. 3-4)

1. Open the cassette door, and lift the door assembly up.
2. Remove the dress plate by the cassette mechanism assembly catches up.

Cassette Mechanism Assembly (Fig. 3-4)

Remove the 4 screws ❸.

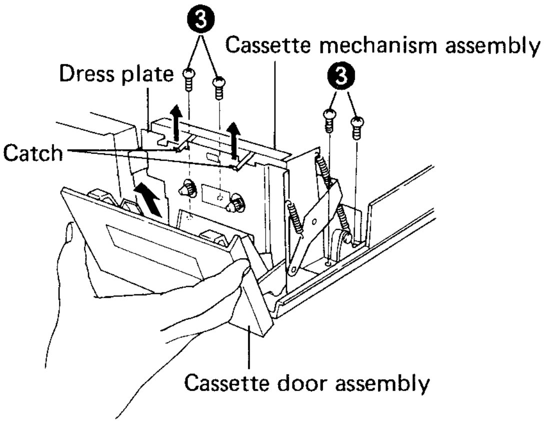

❸
Cassette mechanism assembly
Dress plate
❸
Catch
Cassette door assembly

Fig. 3-4 Cassette door assembly removal

Tonearm

1. Remove the arm cap (press the arm cap in lightly to disconnect the catches from the turntable unit). Also remove the tonearm balance weight.
2. Undo the 4 screws ❹ and remove the damper rubber, float springs and insulator cases. Note that different springs are used at each point (and have been marked in black marking ink). The same spring must be returned to the same position when re-assembling.
3. Taking adequate care not to knock or scratch the tonearm, remove the turntable mechanism from the turntable unit.
4. Undo the 6 screws ❺ and remove the arm base from the turntable mechanism (Fig. 3-6).
5. Disconnect the 6 tonearm lead wires shown in Fig. 3-6 from the equalizer amplifier assembly. (The yellow lead wire is the ground lug unit lead wire. The green, blue, black and yellow lead wires soldered together are all to be separated from each other).
6. Undo the screw ❻ and remove the equalizer amplifier assembly.
7. Disconnect the AS operation spring from the PU plate assembly. Then loosen the screw ❼ and remove the PU plate.
8. Loosen the set screw ❽ to finally enable the tonearm to be removed.

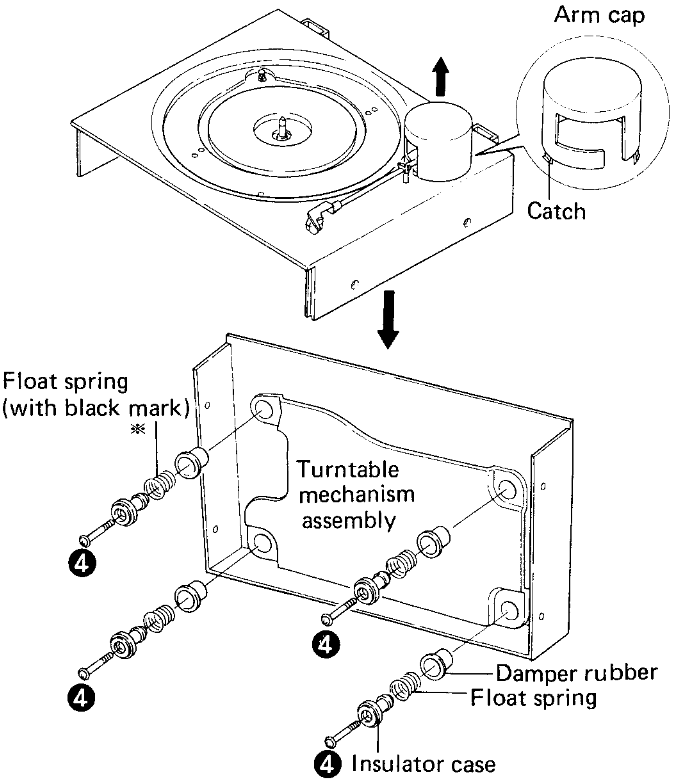

Arm cap
Catch
Float spring
(with black mark)
※
Turntable mechanism assembly
❹
❹
❹
Damper rubber
Float spring
❹ Insulator case

Fig. 3-5 Turntable mechanism assembly removal

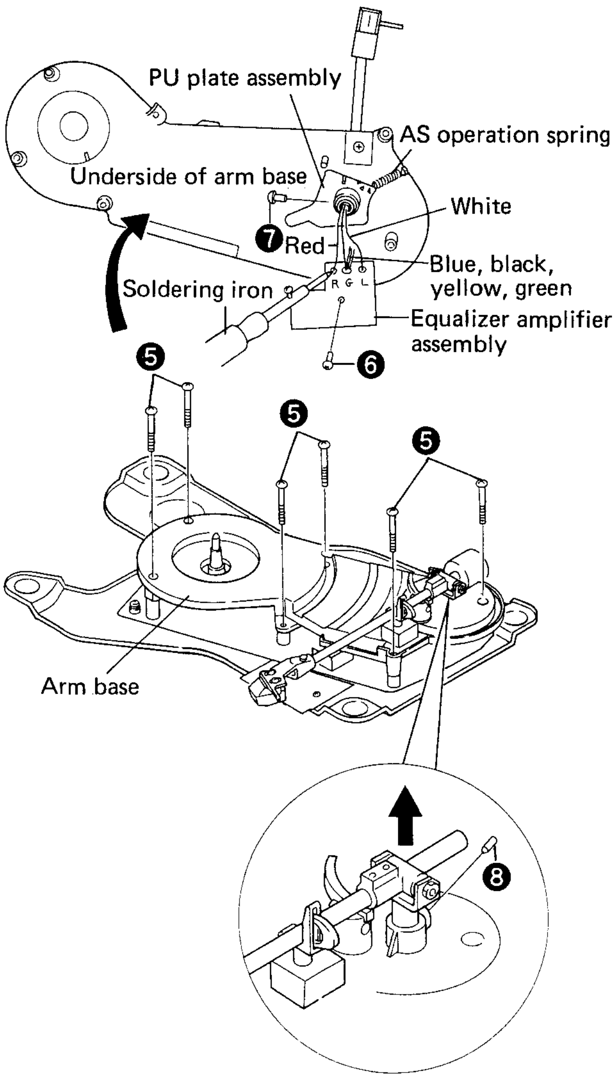
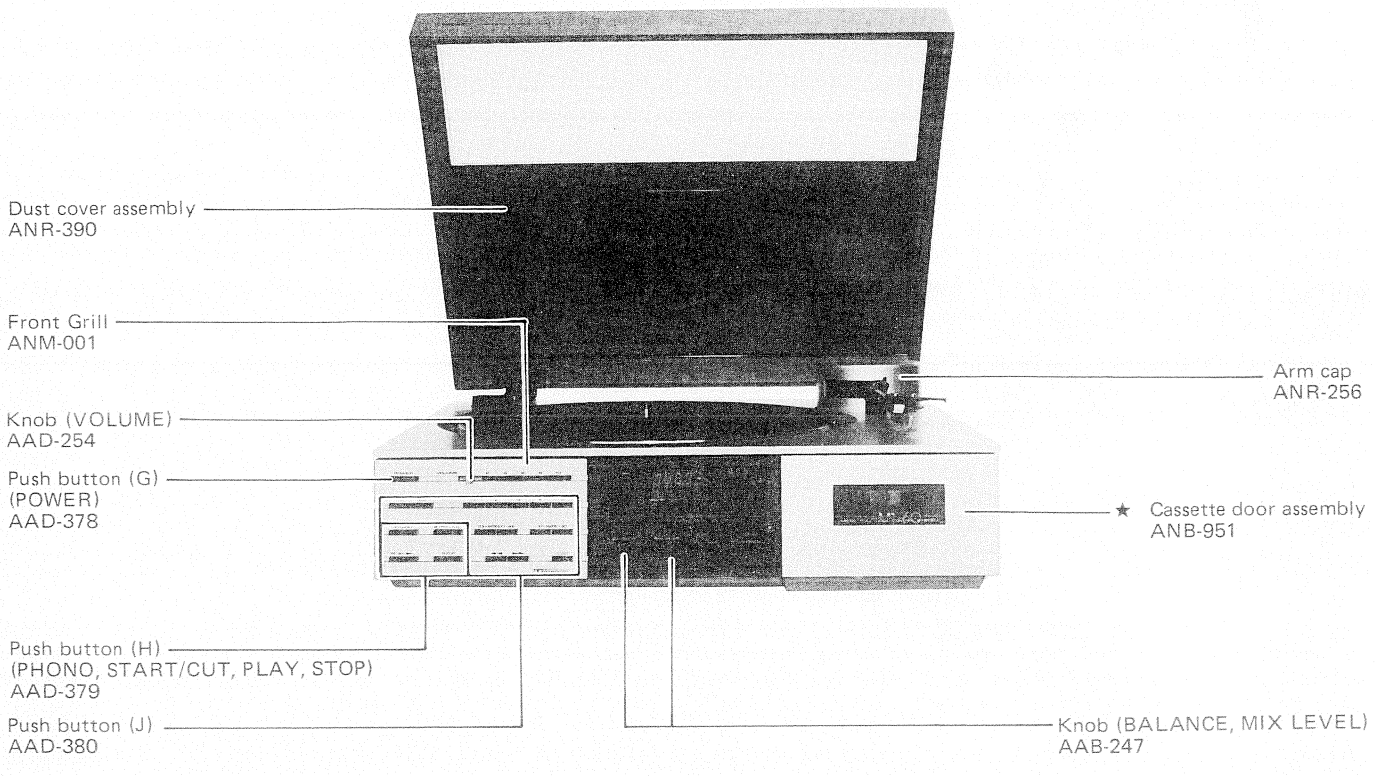

PU plate assembly
AS operation spring
Underside of arm base
White
❼Red
Blue, black, yellow, green
Soldering iron
R G L
Equalizer amplifier assembly
❺
❻
❺
❺
Arm base
❽

Fig. 3-6 Tonearm removal

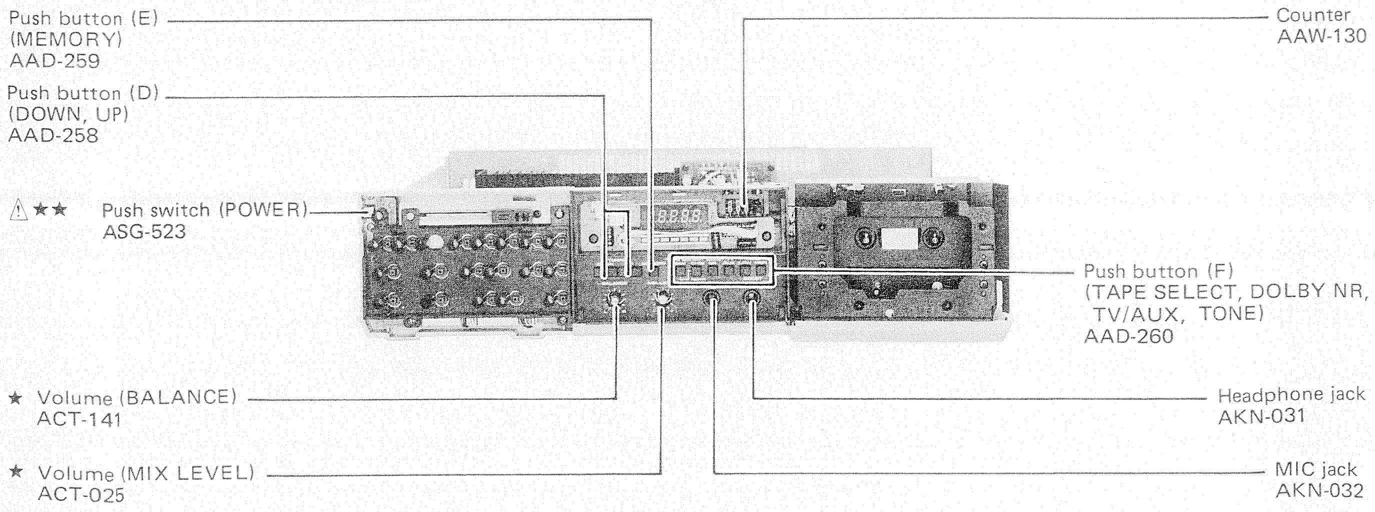
4. PARTS LOCATION

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number , temperature, humidity, etc.
- *Parts without part number can not be supplied.*

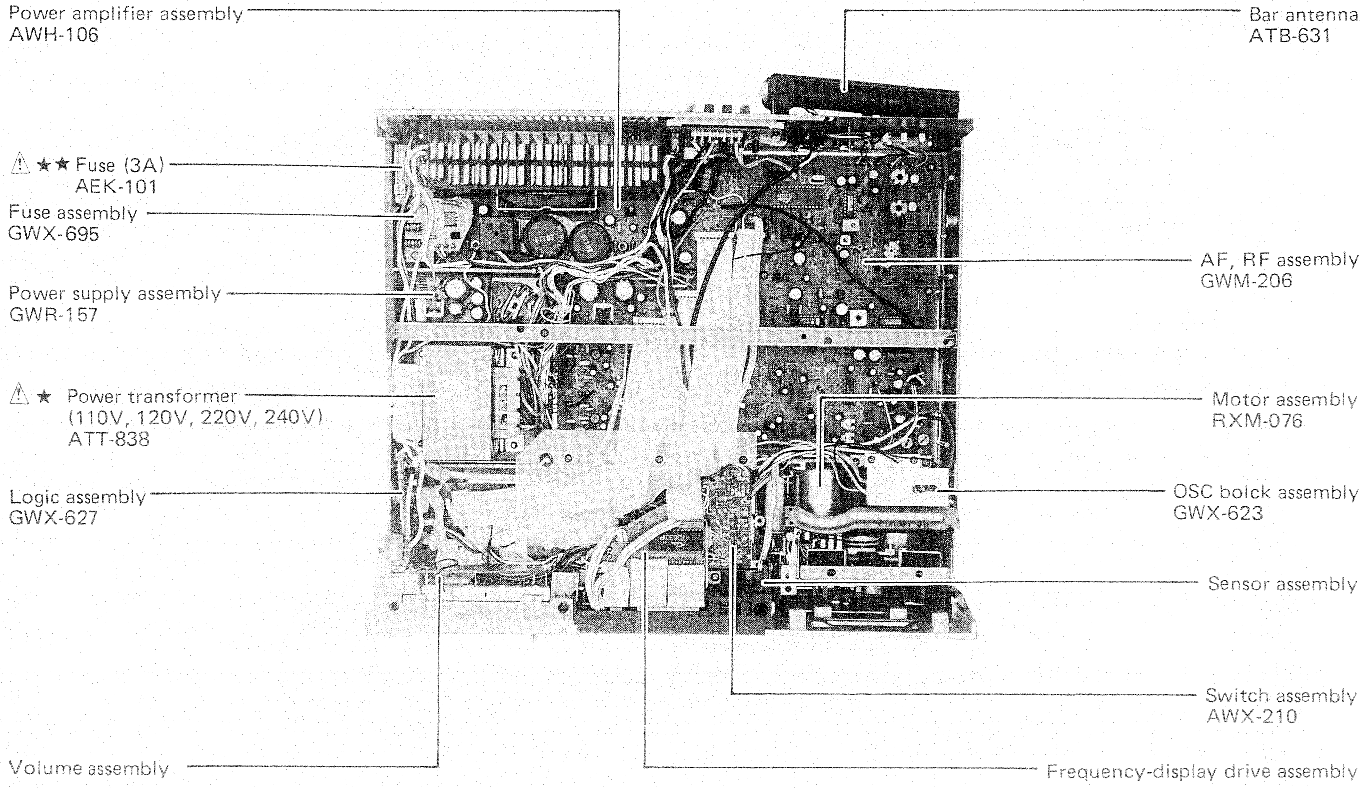
Front Panel View


Dust cover assembly
ANR-390
Front Grill
ANM-001
Knob (VOLUME)
AAD-254
Push button (G)
(POWER)
AAD-378
Push button (H)
(PHONO, START/CUT, PLAY, STOP)
AAD-379
Push button (J)
AAD-380
Arm cap
ANR-256
★ Cassette door assembly
ANB-951
Knob (BALANCE, MIX LEVEL)
AAB-247

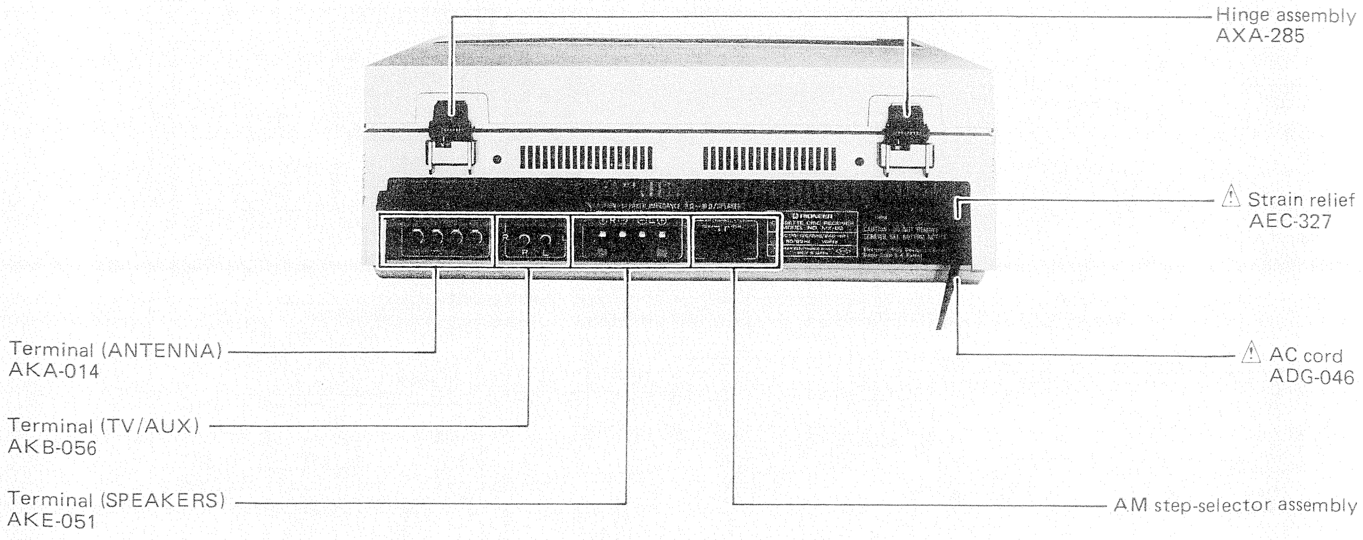
Front View with Grill and Door Removed


Push button (E)
(MEMORY)
AAD-259
Push button (D)
(DOWN, UP)
AAD-258
⚠★★ Push switch (POWER)
ASG-523
★ Volume (BALANCE)
ACT-141
★ Volume (MIX LEVEL)
ACT-025
Counter
AAW-130
Push button (F)
(TAPE SELECT, DOLBY NR,
TV/AUX, TONE)
AAD-260
Headphone jack
AKN-031
MIC jack
AKN-032

Top View with Turntable Assembly Removed

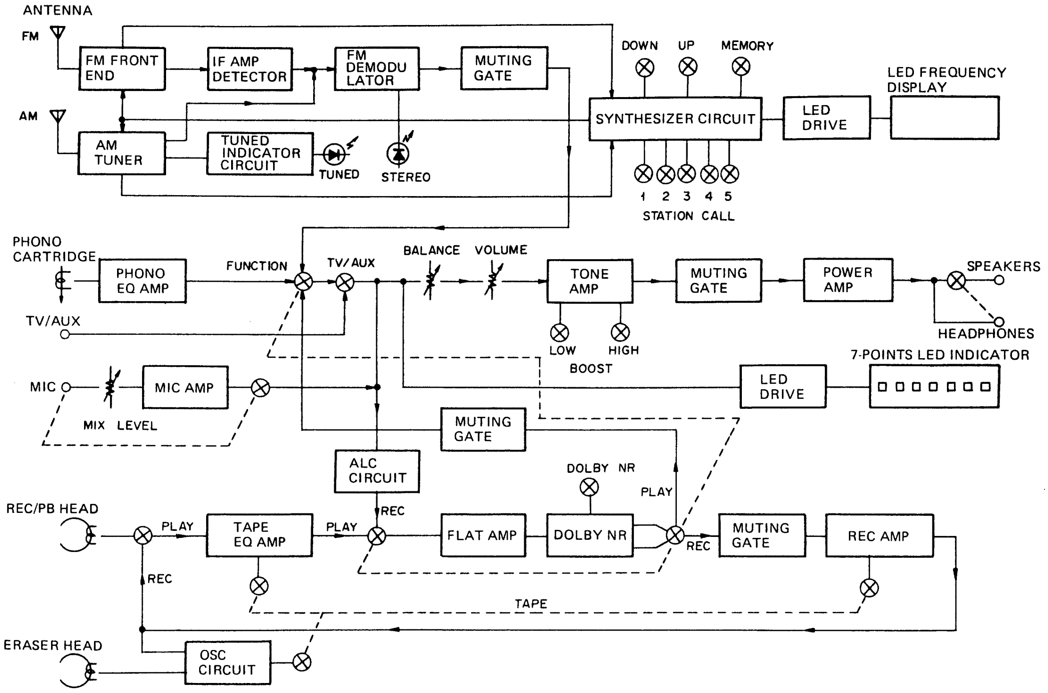

Power amplifier assembly
AWH-106
⚠ ★★ Fuse (3A)
AEK-101
Fuse assembly
GWX-695
Power supply assembly
GWR-157
⚠ ★ Power transformer
(110V, 120V, 220V, 240V)
ATT-838
Logic assembly
GWX-627
Volume assembly
Bar antenna
ATB-631
AF, RF assembly
GWM-206
Motor assembly
RXM-076
OSC bolck assembly
GWX-623
Sensor assembly
Switch assembly
AWX-210
Frequency-display drive assembly

Rear Panel View

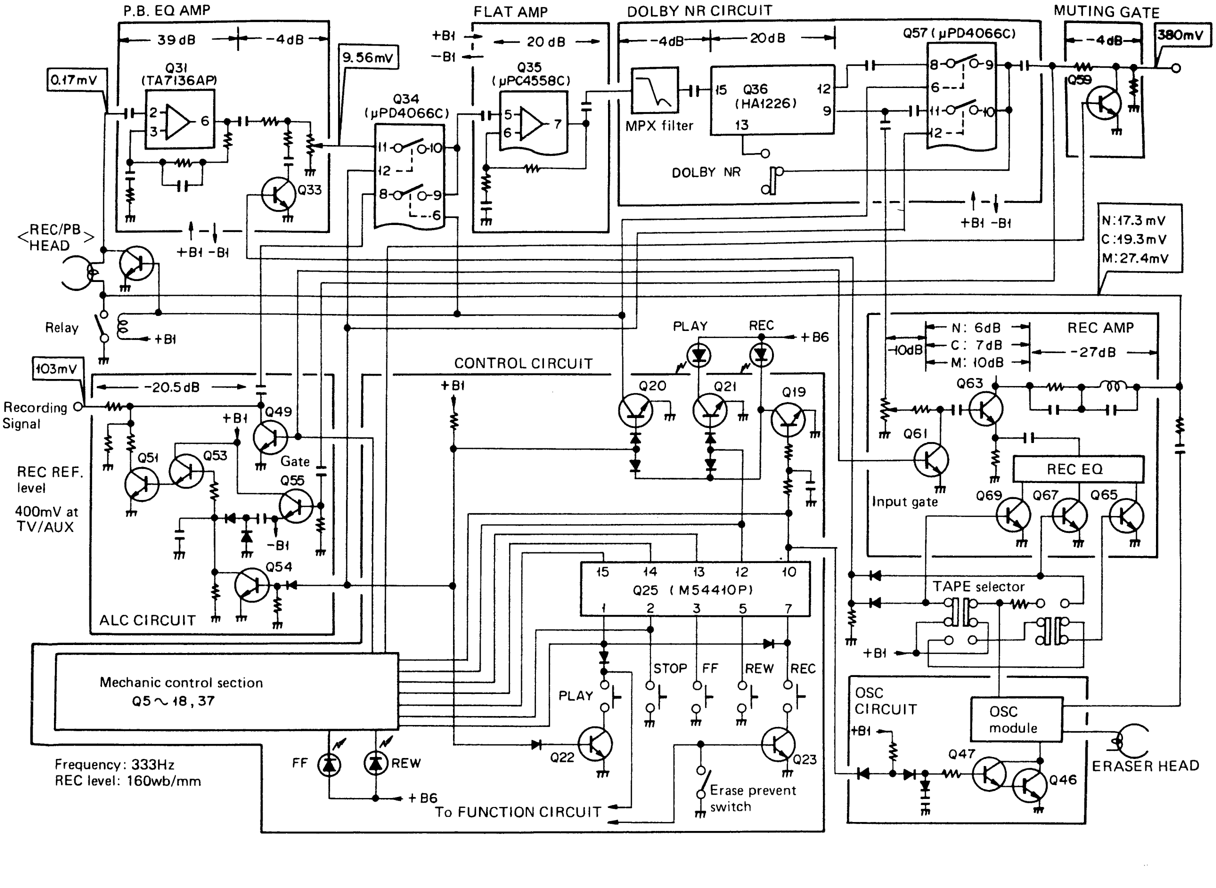

Hinge assembly
AXA-285
⚠ Strain relief
AEC-327
⚠ AC cord
ADG-046
AM step-selector assembly
Terminal (ANTENNA)
AKA-014
Terminal (TV/AUX)
AKB-056
Terminal (SPEAKERS)
AKE-051

5. BLOCK DIAGRAM

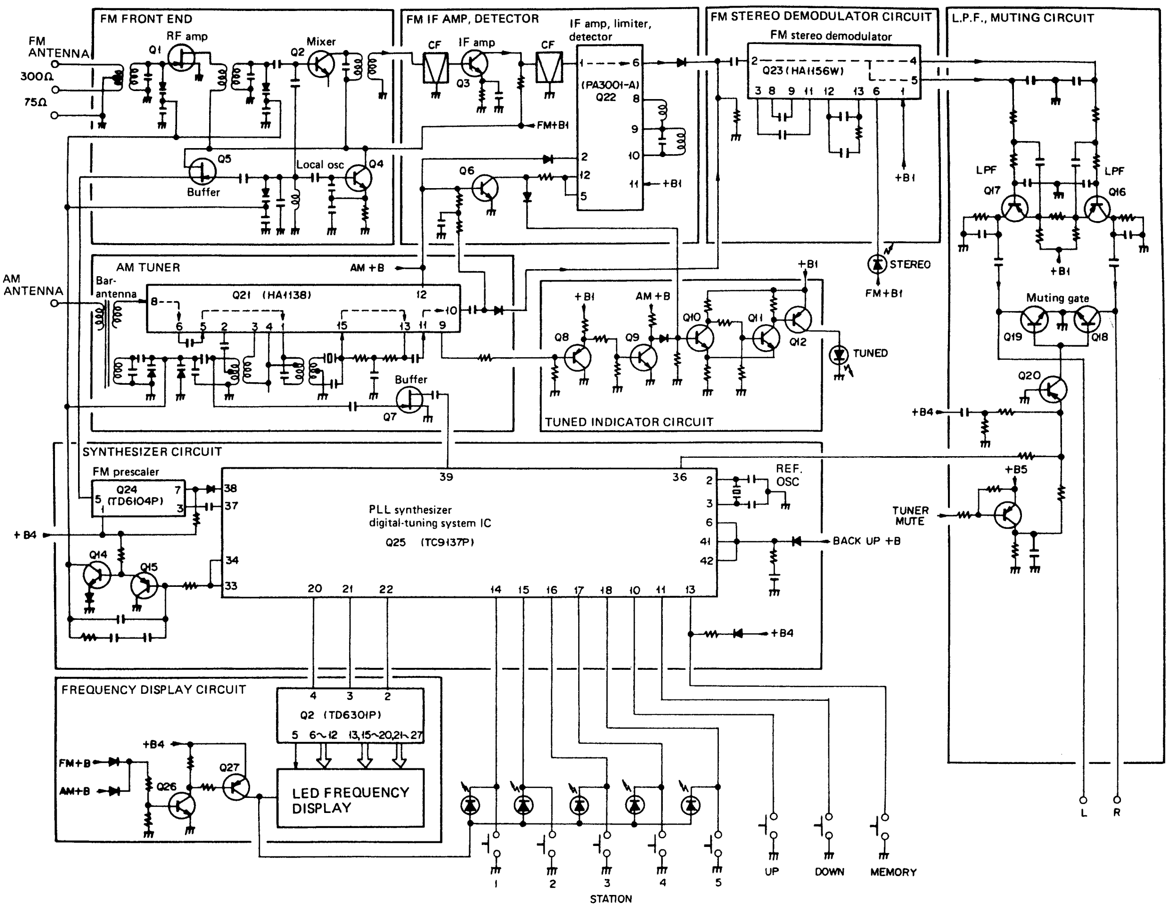
Circuit Component


ANTENNA
FM
AM
FM FRONT END
IF AMP DETECTOR
FM DEMODULATOR
MUTING GATE
AM TUNER
TUNED INDICATOR CIRCUIT
TUNED
STEREO
DOWN
UP
MEMORY
SYNTHESIZER CIRCUIT
LED DRIVE
LED FREQUENCY DISPLAY
1 2 3 4 5
STATION CALL
PHONO CARTRIDGE
PHONO EQ AMP
FUNCTION
TV/AUX
BALANCE
VOLUME
TONE AMP
MUTING GATE
POWER AMP
SPEAKERS
HEADPHONES
LOW
HIGH
BOOST
TV/AUX
MIC
MIC AMP
MIX LEVEL
LED DRIVE
7-POINTS LED INDICATOR
MUTING GATE
ALC CIRCUIT
DOLBY NR
PLAY
REC/PB HEAD
PLAY
TAPE EQ AMP
PLAY
REC
FLAT AMP
DOLBY NR
REC
MUTING GATE
REC AMP
REC
TAPE
ERASER HEAD
OSC CIRCUIT

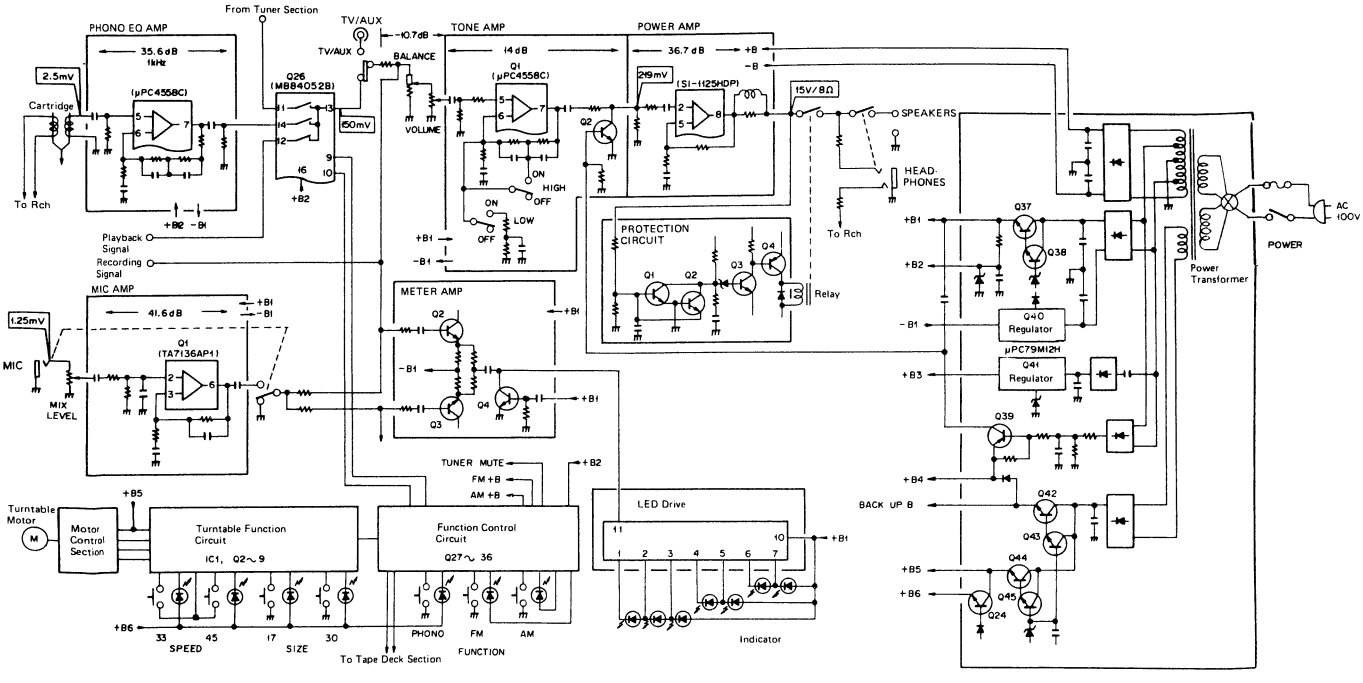
Tape Deck Section


P.B. EQ AMP
39dB
-4dB
Q31 (TA7136AP)
0.17mV
9.56mV
Q33
+B1 -B1
REC/PB HEAD
Relay
+B1
FLAT AMP
+B1
-B1
20 dB
Q35 (µPC4558C)
Q34 (µPD4066C)
DOLBY NR CIRCUIT
-4dB
20dB
MPX filter
Q36 (HA1226)
DOLBY NR
Q57 (µPD4066C)
+B1 -B1
MUTING GATE
-4dB
380mV
Q59
N: 17.3 mV
C: 19.3mV
M: 27.4mV
103mV
-20.5dB
Recording Signal
REC REF. level
400mV at TV/AUX
Q49
Q51
Q53
Gate
Q55
-B1
Q54
ALC CIRCUIT
CONTROL CIRCUIT
+B1
PLAY
REC
+B6
Q20
Q21
Q19
Q25 (M54410P)
15 14 13 12 10
1 2 3 5 7
STOP
FF
REW
REC
PLAY
Q22
Q23
Erase prevent switch
+B6
To FUNCTION CIRCUIT
Mechanic control section
Q5～18, 37
FF
REW
Frequency: 333Hz
REC level: 160wb/mm
REC AMP
-10dB
N: 6dB
C: 7dB
M: 10dB
-27dB
Q63
Q61
Input gate
REC EQ
Q69
Q67
Q65
TAPE selector
+B1
OSC CIRCUIT
+B1
OSC module
Q47
Q46
ERASER HEAD

Tuner Section


FM FRONT END
FM ANTENNA
300Ω
75Ω
RF amp
Q1
Mixer
Q2
Q5
Buffer
Local osc
Q4
FM IF AMP, DETECTOR
CF
IF amp
Q3
IF amp, limiter, detector
(PA3001-A)
Q22
FM+B1
Q6
+B1
FM STEREO DEMODULATOR CIRCUIT
FM stereo demodulator
Q23 (HA1156W)
STEREO
L.P.F., MUTING CIRCUIT
LPF
Q17
Q16
Muting gate
Q19
Q18
Q20
+B4
+B5
TUNER MUTE
AM ANTENNA
AM TUNER
Bar-antenna
Q21 (HA1138)
AM+B
Buffer
Q7
TUNED INDICATOR CIRCUIT
Q8
Q9
Q10
Q11
Q12
TUNED
SYNTHESIZER CIRCUIT
FM prescaler
Q24 (TD6104P)
PLL synthesizer digital-tuning system IC
Q25 (TC9137P)
REF. OSC
BACK UP +B
Q14
Q15
FREQUENCY DISPLAY CIRCUIT
Q2 (TD6301P)
LED FREQUENCY DISPLAY
Q26
Q27
FM+B
AM+B
1
2
3
4
5
STATION
UP
DOWN
MEMORY
L
R

Audio Amplifier Section


From Tuner Section
PHONO EQ AMP
35.6dB 1kHz
2.5mV
Cartridge
(μPC4558C)
To Rch
Q26 (MB84052B)
150mV
TV/AUX
-10.7dB
BALANCE
VOLUME
TONE AMP
14dB
Q1 (μPC4558C)
Q2
ON
HIGH
OFF
LOW
POWER AMP
36.7dB
219mV
(SI-1125HDP)
15V/8Ω
SPEAKERS
HEAD-PHONES
To Rch
PROTECTION CIRCUIT
Q1
Q2
Q3
Q4
Relay
Playback Signal
Recording Signal
MIC AMP
41.6dB
1.25mV
MIC
MIX LEVEL
Q1 (TA7136AP1)
METER AMP
Q2
Q3
Q4
TUNER MUTE
FM+B
AM+B
+B2
+B5
+B6
Turntable Motor
Motor Control Section
Turntable Function Circuit
IC1, Q2~9
SPEED
SIZE
33
45
17
30
Function Control Circuit
Q27~36
PHONO
FM
AM
FUNCTION
To Tape Deck Section
LED Drive
Indicator
Q37
Q38
Q40 Regulator
μPC79M12H
Q41 Regulator
Q39
Q42
Q43
Q44
Q45
Q24
BACK UP B
+B1
+B2
-B1
+B3
+B4
+B5
+B6
Power Transformer
AC 100V
POWER

6. CIRCUIT DESCRIPTIONS

6.1 BRIEF DESCRIPTION OF COMPONENT CIRCUITS

Audio Amplifier Section

- **Phono Equalizer Amplifier**
  NF type equalizer with operational amplifier IC (μPC4558C).
- **Function Switch**
  Full-logic one-touch operation with electronic control switch (MB84052B).
- **Mic Amplifier**
  Low-noise IC (TA7136AP1) monaural amplifier.
- **Tone Amplifier**
  NF type amplifier with low and high boosting and operational amplifier (μPC4558C).
- **Power Amplifier**
  Hybrid IC (SI-1125HDP) employed for output of 30W + 30W (RL=8Ω).
- **Level Indicator**
  7-point LED display.
- **Protector Circuit**
  In addition to relay switching of speaker output upon detection of DC voltages at the output terminals, the protector circuit also incorporates a muting function for muting the output when the power is switched ON and OFF.

Turntable Section

- **Turntable Mechanism Control Stage**
  Full-logic one-touch operation based on 4 NAND gate IC (TC4011BP).

Tape Deck Section

- **Tape Playback Equalizer Amplifier**
  Low-noise IC (TA7136AP1).
- **Flat Amplifier**
  Operational amplifier IC (μPC4558C).
- **ALC Circuit**
  Limiter type automatic level control circuit with transistors used as the variable resistance elements.
- **Recording Amplifier**
  Single transistor recording amplifier.
- **Oscillator**
  Oscillator circuit module for handling metal tapes.
- **Dolby Noise Reduction Circuit**
  Dolby B type IC (HA11226).
- **Record/Playback Switching Stage**
  Electronic switching IC (μPD4066C).
- **Tape Selector**
  Complete electronic processing with no unnecessary signal lines.
- **Tape Deck Mechanism Control Stage**
  Full-logic one-touch operation based on deck key controller IC (M54410P).

Tuner Section

- **FM Stage**
  Electronic tuning front-end with 3 variable capacitance diodes (corresponding to a 3-ganged tuning capacitor) and dual ceramic filter IF stage with single transistor IF amplifier and IF system IC (PA3001-A).
- **AM Stage**
  Electronic tuning circuit with 2 variable capacitance diodes replacing the 2-ganged tuning capacitor, and based on the AM tuner IC (HA1138).
- **MPX Stage**
  FM stereo decoder IC (HA1156W).
- **Synthesizer Stage**
  FM prescalar IC (TD6104P) and synthesizer IC (TC9137P).
- **Frequency Display**
  LED digital display unit driven by static drive IC (TD6301P).

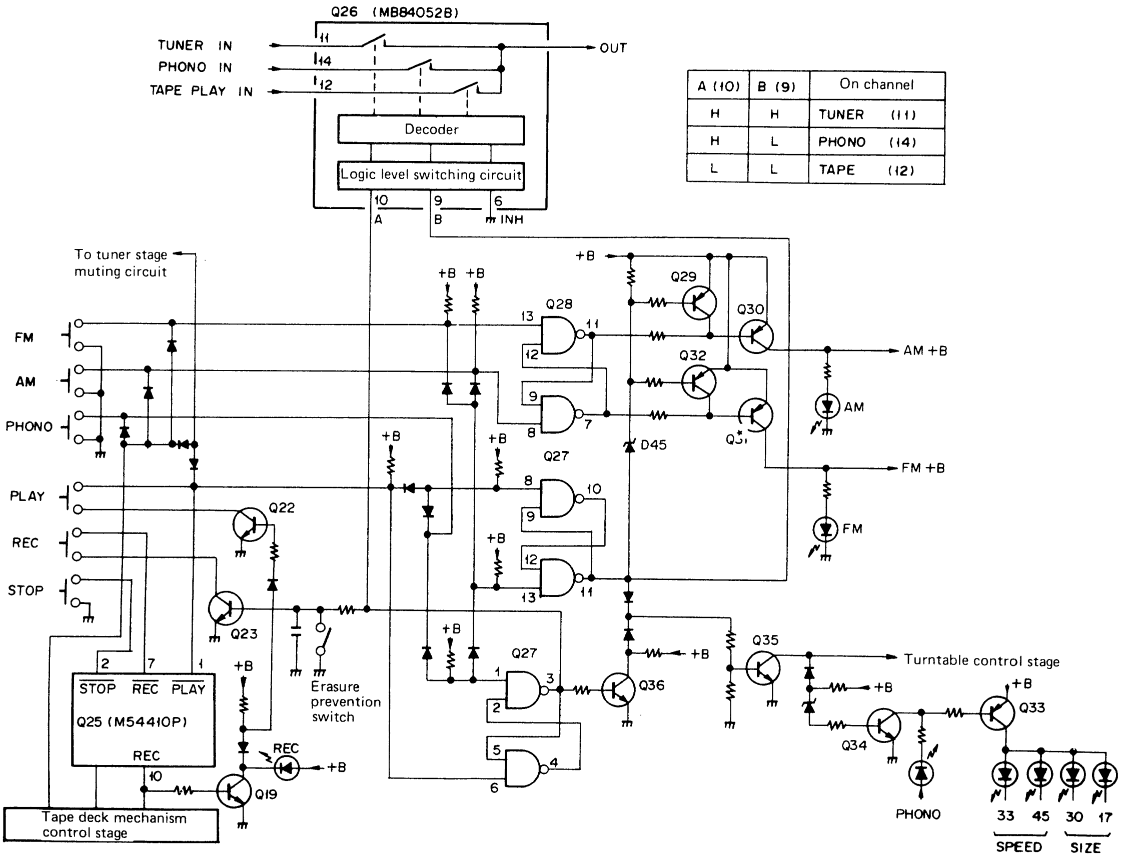
6.2 FUNCTION SWITCHING CONTROL CIRCUIT

Signal line switching involves the use of a C-MOS IC (MB84052B) with a switching function equivalent to 4 contacts in 2 lines. In the MX-80, 3 contacts in 2 lines are employed for switching the TUNER, PHONO and TAPE PLAY signal lines (Fig. 6-1). The switching control signals are applied to pins 9 and 10 of this IC. When H level (+5.8V in the MX-80) is applied to both pins, the TUNER signal is obtained. Applying L to pin 9 and H to pin 10 results in output of the PHONO signal, while applying L to both pins results in the TAPE PLAY signal.

The MB84052B control circuit consists of an R-S flip-flop based on the 4 NAND gate IC (μPC4011C).

When the FM button is pressed, pins 1 and 13 of Q27 are switched to L level and pins 3 and 11 to H level. And with pin 13 of Q28 at L level, pin 11 is switched to H level and pin 7 to L level. As a result, Q29, Q30 and Q32 are turned off, Q31 turned on, and +B supplied to the FM stage. Pins 9 and 10 of MB84052B are switched to H level and the TUNER circuit thus turned on. When the AM button is pressed, on the other hand, pins 7 and 11 of Q28 are inverted (in respect to FM mode), thereby resulting in Q29, Q31 and Q32 being turned off and Q30 on for +B to be supplied to the AM stage. When the PHONO button is pressed, pin 11 of Q27 is switched to L level and pin 3 to H level. Q36 is thus turned on, Q35 off, and Q34 and Q33 on, thereby enabling operation of the turntable control stage. Pin 9 of MB84052B is switched to L and pin 10 to H level, thereby turning the PHONO circuit on. And since Q29 and Q32 are on at this time, Q30 and Q31 are turned off, thereby cutting the +B supply to the AM and FM stages.

When the PLAY button is pressed, pins 3 and 11 of Q27 are switched to L level if Q22 is on (this transistor being switched off when the MX-80 is in recording mode, thereby preventing direct switching from recording to playback mode — see section "7.4 Tape Deck Mechanism Control Stage" for further details). Pins 9 and 10 of MB84052B are thus both switched to L level and the TAPE PLAY circuit turned on. In addition, pressing the PLAY button also switches pin 1 of the tape deck controller IC in the tape deck section to L level to switch the MX-80 to playback mode. Q23 in this case is turned off (this transistor being used to prevent direct switching from playback to recording mode — see section "7.4 Tape Deck Mechanism Control Stage" for further details).


Q26 (MB84052B)
TUNER IN
PHONO IN
TAPE PLAY IN
OUT
Decoder
Logic level switching circuit
A
B
INH
To tuner stage muting circuit
FM
AM
PHONO
PLAY
REC
STOP
Q22
Q23
Erasure prevention switch
STOP REC PLAY
Q25 (M54410P)
REC
Q19
Tape deck mechanism control stage
+B
Q28
Q27
Q29
Q30
Q32
Q31
D45
AM +B
FM +B
Q35
Q36
Turntable control stage
Q33
Q34
PHONO
33
45
30
17
SPEED
SIZE

A (10)	B (9)	On channel
H	H	TUNER (11)
H	L	PHONO (14)
L	L	TAPE (12)

Fig. 6-1 Function switching control circuit

6.3 TAPE DECK SIGNAL STAGE

ALC Circuit

The MX-80 has not been equipped with recording level controls. Optimum recording level is adjusted automatically, and a special circuit (the ALC circuit) is used to control recording level when excessively large input signals are applied.

The recording signal input circuit in the ALC circuit includes an attenuator circuit with transistors as the variable resistance elements, and the attenuator circuit being controlled by rectification of the flat amplifier output. Operating characteristics are determined by limiter, the circuit remaining inactive at low levels, but controlling the signal amplitude of high level input signals.

Dolby NR Circuit

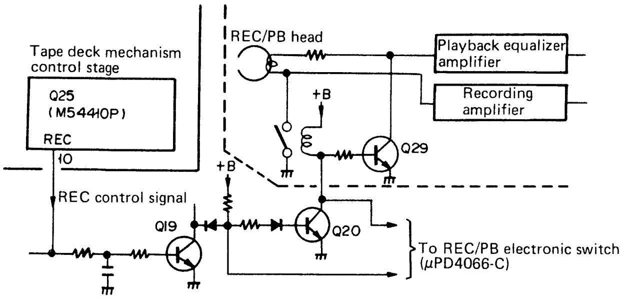
The MX-80 is equipped with a Dolby B type noise reduction system employing a standard type Dolby NR IC (HA11226).

Recording/Playback Switching Circuit

This circuit controls the electronic switch for recording/playback switching and the recording/playback head switching circuit (relay and transistors) by means of a REC control signal (switched to H level only during recording mode) from the tape deck mechanism control circuit. (See Fig. 6-2).

6.4 TAPE DECK MECHANISM CONTROL STAGE

The major circuit component in this circuit is the deck key control IC (M54410P) (see Fig. 6-3). This IC includes 5 R-S flip-flop set/reset input terminals for use with non-lock type switches. Operation is triggered by the trailing edge of the input signal, and the corresponding output status is maintained until input of the next input signal. Both inputs and outputs include pull-up resistances. The operating mode for each input is listed in the following table.

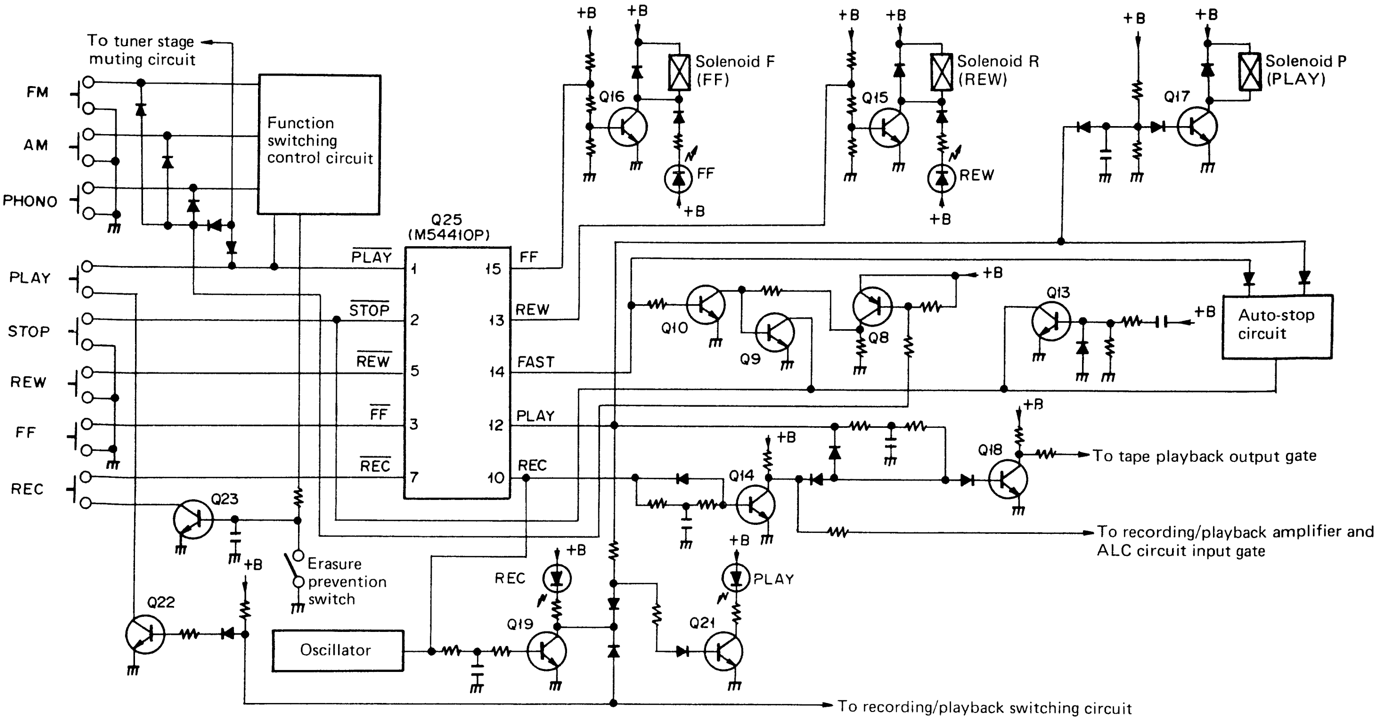


REC/PB head
Playback equalizer amplifier
Recording amplifier
Tape deck mechanism control stage
Q25
(M54410P)
REC
10
+B
Q29
REC control signal
Q19
Q20
To REC/PB electronic switch
(μPD4066-C)

Fig. 6-2 Recording/Playback switching circuit

Operating mode	Input signa	Output					
		FAST ⑭	FF ⑮	REW ⑬	REC ⑩	PAUSE ⑪	PLAY ⑫
STOP Mode	② ⊔	L	L	L	L	L	L
FF Mode	③ ⊔	H	H	L	L	L	L
REW Mode	⑤ ⊔	H	L	H	L	L	L
PLAY Mode	① ⊔	L	L	L	L	L	H
PAUSE Mode	⑥ ⊔	L	L	L	L	H	L
REC/PLAY Mode	⑦① ⊔	L	L	L	H	L	H
REC/PAUSE Mode	⑦⑥ ⊔	L	L	L	H	H	L

Table 1 M54410P Input and corresponding output modes



To tuner stage muting circuit
FM
AM
PHONO
PLAY
STOP
REW
FF
REC
Function switching control circuit
Q25
(M54410P)
PLAY
STOP
REW
FF
REC
1
2
5
3
7
15
13
14
12
10
FF
REW
FAST
PLAY
REC
+B
Solenoid F (FF)
Q16
FF
Solenoid R (REW)
Q15
REW
Solenoid P (PLAY)
Q17
Q13
Auto-stop circuit
Q10
Q9
Q8
Q18
To tape playback output gate
Q14
To recording/playback amplifier and ALC circuit input gate
Q23
Q22
Erasure prevention switch
Oscillator
REC
Q19
PLAY
Q21
To recording/playback switching circuit

Fig. 6-3 Tape deck mechanism control circuit

Operation During Each Mode

Operation of the tape transport mechanism during different modes is described in the next chapter (see page 22). The motor is started when the power is switched on, irrespective of the function selector position.

• Play Mode

The PLAY button also serves as the amplifier section function selector switch. If the PLAY button is pressed with Q22 turned on, the amplifier section function selector is switched to the TAPE PLAY position and Q23 is turned off (Q22 prevents direct switching from recording to playback mode while Q23 prevents direct switching from playback to recording mode). Furthermore, pin 1 of the tape deck controller IC (Q25: M54410P) is switched to L level. Q25 is therefore switched to play mode, and pin 12 alone is switched to H level, resulting in Q17, Q18, Q21 and Q22 being turned on and Q8, Q9, Q10, Q13, Q14, Q15, Q16 and Q19 being turned off. And with Q17 turned on, the play mode solenoid P is activated. The playback output gate is opened by Q18 being turned on, and the PLAY indicator LED turned on by Q21.

• Fast Forward Mode

When the FF button is pressed, pin 3 of Q25 is switched to L level, resulting in Q25 being switched to fast forward mode. Pins 14 and 15 are switched to H level while all other pins are switched to L level, resulting in Q10 and Q16 being turned on. With Q16 on, the fast forward solenoid F is activated and the FF indicator LED turned on. And with Q10 on, the fast forward mode is maintained despite changes in the amplifier section function selector (AM, FM, PHONO).

• Rewind Mode

When the REW button is pressed, on the other hand, pin 5 of Q25 is switched to L level, resulting in Q25 being switched to rewind mode. Pins 13 and 14 are switched to H level while all other pins are switched to L level. As a result, Q10 and Q15 are turned on, with Q15 on resulting in the rewind solenoid R being activated and the REW indicator LED being turned on. And with Q10 on, rewind mode is maintained even if the AM, FM or PHONO button is pressed.

• Recording Mode

If Q23 is on when the REC button is pressed, Q25 is switched to recording/playback mode, pins 10 and 12 are switched to H level and all other pins to L level. (Q23 forms a recording inhibited circuit, and is turned off during playback mode and when the cassette half erasure prevention tab has been broken off). As a result, Q14, Q17 and Q19 are turned on, and Q8, Q9, Q10. Q13, Q15, Q16, Q18, Q21 and Q22 are turned off. With Q14 on, the recording amplifier and ALC circuit input gate is opened, while with Q17 on, playback solenoid P is activated. Q19 is turned on to light up the REC indicator. And with Q22 off at this time, pressing the PLAY button will have no effect.

• Stop Mode

Stop mode is achieved when pin 2 of Q25 is switched to L level. Apart from pressing the STOP button, Q25 pin 2 is switched to L level when the amplifier section selector is switched (except for PLAY position) during playback or recording mode, when the auto-stop circuit is activated (See Page 18) at the end of the tape, and momentarily when the power is switched on. When the function selector is switched to FM, AM or PHONO during playback or recording mode, Q8 is turned on. And since Q10 is off at this time, Q9 is turned on and pin 2 of Q25 thus switched to L level. During the instant the power is switched on, Q13 is turned on momentarily, resulting in pin 2 of Q25 again being switched to L level. When Q25 is switch to stop mode, all Q25 outputs are switched to L level.

Auto-Stop Circuit

When the end of the tape is reached, the tape deck mechanism is stopped automatically by this circuit.

When Q25 is in stop mode (as shown in Fig. 6-4), Q12 is off, Q11 and Q6 on, and Q7 off. During tape transport (playback, fast forward, rewind or recording mode) Q12 is turned on and Q11 off. Due to the photo-interrupter, however, Q6 remains on and Q7 off. Fan blades connected to the rotating tape counter shaft interrupt the LED beam intermittently, resulting in the generation of an AC signal which is rectified by D1 and D2, and used to keep Q6 turned on. When the tape stops and the photo-interrupter no longer generates the AC signal, Q6 is turned off and Q7 on, thereby switching Q25 to stop mode to deactivate the drive mechanism.

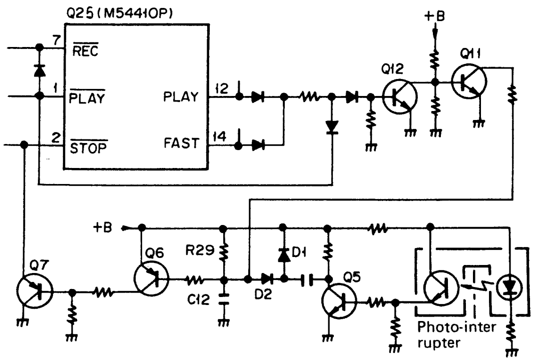


Fig. 6-4 Auto-stop circuit

6.5 TURNTABLE MECHANISM CONTROL STAGE

A description of the operation of the turntable mechanism during different modes is presented in the next chapter.

The circuit consists mainly of R-S flip-flops based on a 4 NAND gate IC (TC4011BP) outlined in Fig. 6-5.

When PHONO has been selected, Q35 is turned off by a signal from the function switching control stage. Q34 is thus turned on to light up the PHONO indicator, while Q33 is turned on to supply +B to the SPEED and SIZE indicators. The S24 switch is used to prevent the SIZE button or the START/CUT button from being used while the tonearm is moving to the lead-in groove.

In the initial state, both S24 and S25 are in the "a" position, the Q3 collector and pin 10 of IC1 (TC4011BP) are switched to H level due to the action of C4 and C6 respectively, while pin 3 is switched to L level due to C5. Consequently, Q4 and Q5 are turned on, and the 45rpm and 17cm indicators light up to indicate a record speed of 45rpm and a record size of 17cm. If the START/CUT button is then pressed, pin 3 of IC1 is switched to H level with pin 1 at L level. Q8 is thereby turned on and the solenoid activated. Q9 is also turned on and the motor is started up. The tonearm, therefore, lifts away from the arm rest and starts to move towards the record. S24 and S25 are both switched to the "b" position at this time, resulting in pins 6 and 3 of IC1 being switched to L level. Q8 remains on, however, since Q7 is turned on by S24. And although Q9 is turned off, the motor continues to operate due to S25 being in the "b" position. When the tonearm reaches the lead-in groove position for the 17cm record, S24 is switched back to the "a" position and Q8 is turned off, thereby releasing the solenoid. If the 33 SPEED button is pressed Q2 is turned off and Q3 turned on, thereby lighting up the 33rpm indicator, and also activating the RL1 relay to switch the motor circuit to 33rpm mode. And with Q4 turned off, the 45rpm indicator is extinguished.

If the 30cm SIZE button and the START/CUT button are pressed, pin 10 of IC1 is switched to L level with pin 13 also at L level, while pin 3 is switched to H level with pin 1 at L level. With pin 10 at L level, Q5 is turned off and Q6 turned on, thereby lighting up the 30cm indicator. And with pin 3 at H level, Q8 and Q9 are turned on, thereby activating the solenoid and starting up the motor. The tonearm is thus lifted and moved towards the lead-in groove, and S24 and S25 are switched to the "b" position. Pin 6 of IC1 is switched to L level by S24, resulting in pin 3 also being switched to L level. And due to pin 10 of IC1 being at L level at this time, Q7 is off, and Q8 is also turned off. The solenoid is thereby released, and the tonearm stops when it reaches the lead-in groove position of the 30cm record and subsequently lowers onto the record.

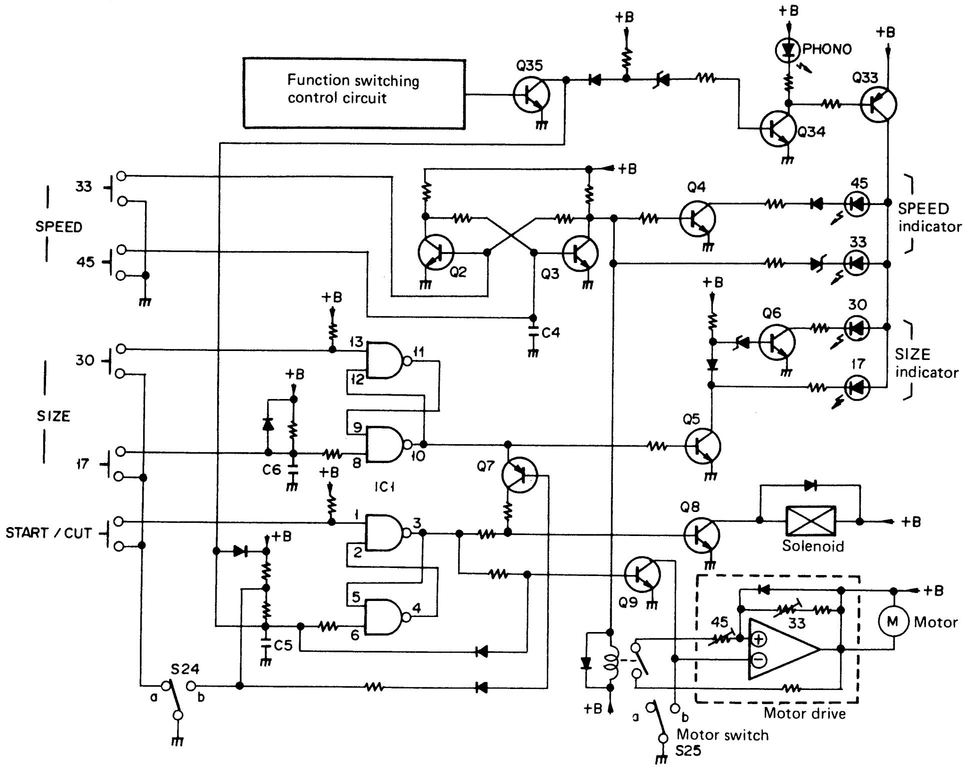

Function switching control circuit
Q35
+B
+B
PHONO
+B
Q33
Q34
33
SPEED
45
+B
Q4
45
SPEED indicator
Q2
Q3
33
+B
+B
C4
Q6
30
30
SIZE
17
SIZE indicator
+B
13
11
12
9
17
C6
+B
8
10
IC1
Q7
Q5
Q8
+B
Solenoid
START / CUT
1
3
+B
2
5
4
Q9
45
33
+B
Motor
6
C5
S24
a
b
+B
a
b
Motor drive
Motor switch
S25

Fig. 6-5 Turntable mechanism control circuit

6.6 SYNTHESIZER CIRCUIT

Basic Principles

The major circuit components in the quartz PLL synthesizer (see Fig. 6-6) include the voltage controlled oscillator (VCO), programmable counter, phase comparator, reference frequency oscillator and loop filter. The loop formed can be expressed by fr = fs/N where fr is the reference frequency, fs the VCO frequency, and N (an integer number) the frequency division ratio of the programmable counter. And if fr is constant, the VCO frequency will be determined by the programmable counter frequency division ratio, i.e. an integer multiple of fr.

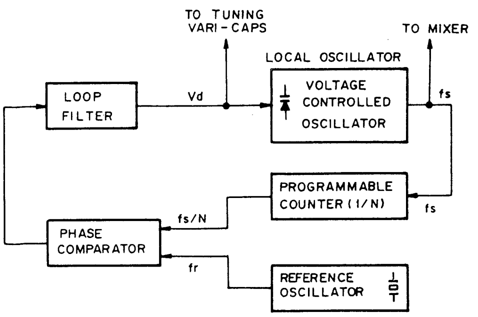

TO TUNING VARI - CAPS
TO MIXER
LOCAL OSCILLATOR
LOOP FILTER
Vd
VOLTAGE CONTROLLED OSCILLATOR
fs
PROGRAMMABLE COUNTER (1/N)
fs/N
fs
PHASE COMPARATOR
fr
REFERENCE OSCILLATOR

Fig. 6-6 Synthesizer block diagram

Synthesizer Circuit Composition

The MX-80 synthesizer circuit and its accompanying control circuit are based on a single-chip C-MOS IC (TC9137P). (See Fig. 6-7).

In general, due to the C-MOS IC operational speed limits, the reference frequency is divided by 8 in a fixed frequency divider before being applied to the synthesizer IC input during FM reception. In this case, since fr = fs/8N, fr is set to 12.5kHz. Since the loop filter may not be able to completely remove this 12.5kHz signal, a small amount may tend to leak into the local oscillator and end up as residual noise in the signal line. The TC9137P used in the MX-80 is combined with a prescalar IC (TD6104P), and by employing a pulse-swallow counting method where frequency division also includes switching of the prescalar frequency division ratio by means of 2 sets of programmable counters, a reference frequency of 25kHz outside the playback frequency range is employed. In addition to suppressing loop filter leakage, a higher S/N ratio is also obtained.

• Reference Frequency

Output signals from the 7.2MHz quartz oscillator connected to pins 2 and 3 of TC9137P are divided by 288 (to 25kHz) during FM reception, and by 800 (to 9kHz) during AM reception, and then applied to the phase comparator.

• Programmable Counter

During FM reception, 2 sets of counters and the pin 38 signal are used to control the prescalar IC (TD6104P) by a pulse-swallow counting method.

During AM reception, a direct frequency division method is employed.

• Phase Comparator

The phase of the programmable counter output is compared with the phase of the reference frequency. If the programmable counter output signal phase is delayed, pins 33 and 34 are switched to L level for a period corresponding to the difference in phase. If, however, the phase is advanced, pins 33 and 34 are switched to H level instead. Apart from these specific periods, pins 33 and 34 are switched to high impedance.

By integrating the pin 33 & 34 outputs (by passing through a low-pass filter) and applying the result to the VCO (local oscillator) variable capacitance diode, the PLL synthesizer circuit is established.

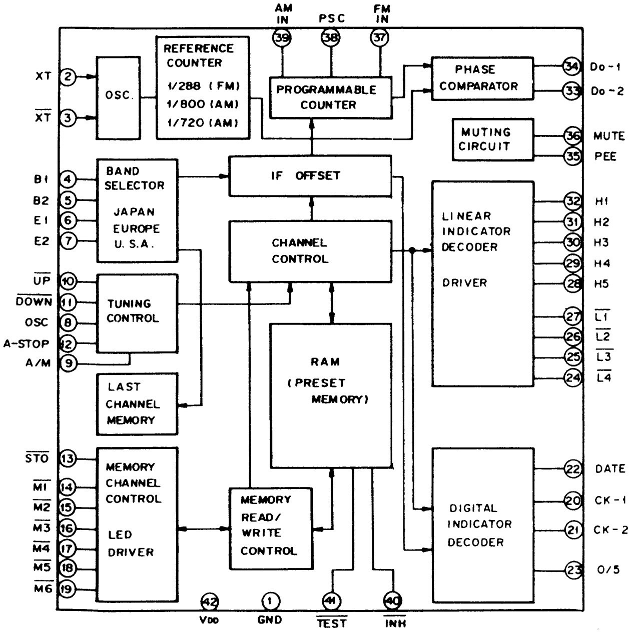

AM IN
PSC
FM IN
39
38
37
REFERENCE COUNTER
1/288 (FM)
1/800 (AM)
1/720 (AM)
XT
2
XT
3
OSC.
PROGRAMMABLE COUNTER
PHASE COMPARATOR
34
Do-1
33
Do-2
MUTING CIRCUIT
36
MUTE
35
PEE
B1
4
B2
5
E1
6
E2
7
BAND SELECTOR
JAPAN
EUROPE
U. S. A.
IF OFFSET
CHANNEL CONTROL
LINEAR INDICATOR DECODER
DRIVER
32
H1
31
H2
30
H3
29
H4
28
H5
27
L1
26
L2
25
L3
24
L4
UP
10
DOWN
11
OSC
8
A-STOP
12
A/M
9
TUNING CONTROL
LAST CHANNEL MEMORY
RAM (PRESET MEMORY)
STO
13
M1
14
M2
15
M3
16
M4
17
M5
18
M6
19
MEMORY CHANNEL CONTROL
LED DRIVER
MEMORY READ/ WRITE CONTROL
DIGITAL INDICATOR DECODER
22
DATE
20
CK-1
21
CK-2
23
O/S
42
VDD
1
GND
41
TEST
40
INH

Fig. 6-7 TC9137P block diagram

Synthesizer Control

• Selection of Reception Band

The band received by the TC9137P is determined by the combination of inputs applied to B1, B2, E1 and E2. B1 and B2 are used in selecting the AM and FM bands. AM is selected (IF = 450kHz) when both terminals are switched to L level, while FM is selected (IF = 10.7MHz) when both terminals are switched to H level.

• Tuning

When the UP terminal is switched to L level for a brief period of time, the reception frequency is increased by a single 100kHz step during FM reception, or a single 9kHz step during AM reception. And when the DOWN terminal is similarly switched to L level, the reception frequency is decreased by the same degree. If either terminal is kept at L level in excess of a certain fixed length of time, the reception frequency is increased or decreased rapidly until the L level status is cancelled. When the reception frequency reaches either end of the band, the shift operation stops.

• Preset Memory

The TC9137P incorporates presettable memories for 6 FM stations and 6 AM stations. The MX-80 is designed to employ 5 of these memories in each band.

Memory write enable status is obtained for several seconds when the STO pin is briefly switched to L level. Switching any pin (M1 ~ M6) to L level during these few seconds will result in memory addressing for the corresponding memory, and the reception frequency at that time being stored in that memory. If, however, no memory address is designated, the memory write enable status will be cancelled within a few seconds.

Any memory can be called by switching one of the M1 to M5 pins to L level, resulting in reception of the corresponding frequency.

• Last Frequency Memory

The TC9137P also includes a sub-memory for automatic storage of reception frequency data when switching FM/AM bands. The frequency tuned prior to the switching will thus be received automatically when switching back to that band.

- **Memory Maintenance**

The MX-80 is equipped with a Ni-Cd battery (rechargable) in order to retain memory contants after the main power has been switched off. The TC9137P includes an inhibit function where all operations become static (all outputs and the oscillator are stopped). This function is activated when the INH pin is switched to L level, thereby reducing the current requirement to less than 10μA with back-up voltage of 2V).

Note that the inhibit function is also effective for function positions apart from TUNER.

6.7 FREQUENCY DISPLAY CIRCUIT

By adding a reception frequency display static driver IC (TD6301P) to the synthesizer IC (TC9137P), received frequencies can be displayed in 4-digit displays by the LED numerical display unit.

The connections between TC9137P and TD6301P include 2 timing signal lines and 1 data signal line. Data signals are transferred in single cycles (see Fig. 6-8) where there is a change in the received frequency due to FM/AM band switching, memory calling, UP/DOWN operations or switching the power on. Each data signal is a 16-bit binary coded signal with 11 bits containing the received frequency data and 5 bits containing the band data. The received frequency data contains the difference between the received frequency and the minimum receivable frequency (88.0MHz for FM and 522kHz for AM) encoded as 11 bits of binary data (there being no decimal point for FM).

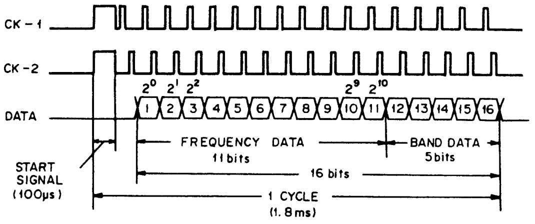

CK-1
CK-2
DATA
2^0 2^1 2^2
2^9 2^{10}
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
START SIGNAL (100μs)
FREQUENCY DATA 11bits
BAND DATA 5bits
16 bits
1 CYCLE (1.8ms)

Fig. 6-8 Frequency data signal

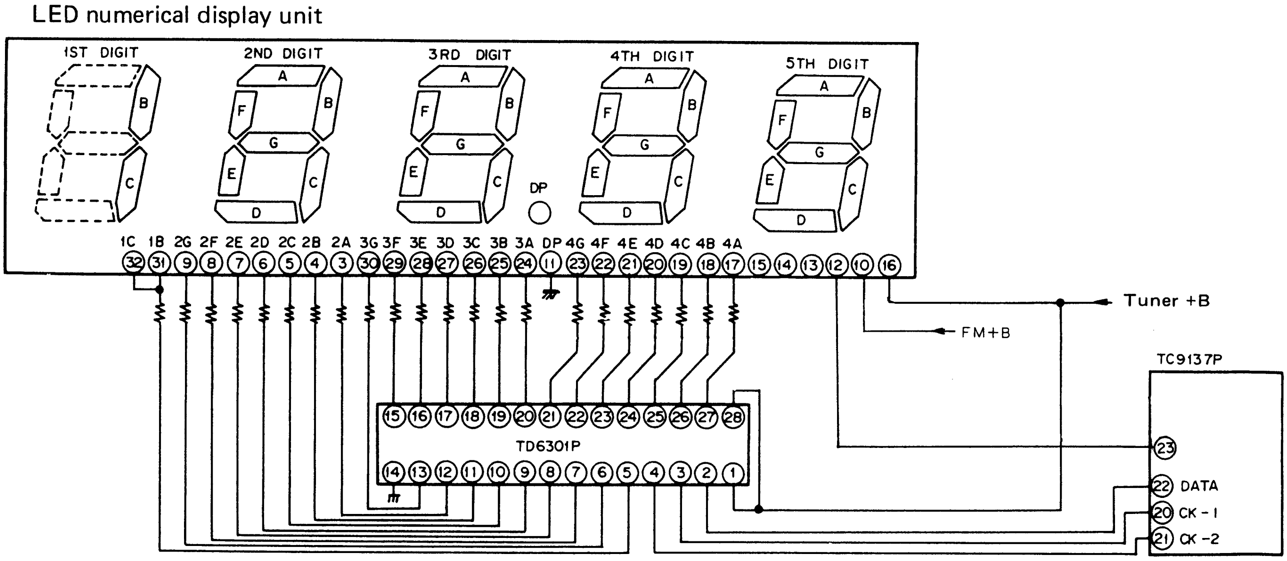

LED numerical display unit
1ST DIGIT
2ND DIGIT
3RD DIGIT
4TH DIGIT
5TH DIGIT
A
B
C
D
E
F
G
DP
1C 1B 2G 2F 2E 2D 2C 2B 2A 3G 3F 3E 3D 3C 3B 3A DP 4G 4F 4E 4D 4C 4B 4A
TD6301P
Tuner +B
FM+B
TC9137P
DATA
CK-1
CK-2

Fig. 6-9 Reception frequency display circuit

7. MECHANISM DESCRIPTIONS

7.1 TAPE DECK SECTION

Playback Mode

Movement of the head base (where the recording/playback and erase heads are mounted) during playback mode in the MX-80 employs the capstan rotational force.

● Stop Mode (Fig. 7-1)

Fig. 7-1 outlines the head base drive mechanism during stop mode. The operating lever (A) presses down on the cam (C) due to the action of the operating lever spring (B). This cam is joined to a cam gear (D) which is turned in a clockwise direction. Solenoid P is not activated at this time, and with the cam gear stopper (G) checked by the hook of the gear lever (F) due to the action of the gear lever return spring (E), the cam gear remains stationary.

The flywheel is belt-driven by the capstan motor counter clockwise together with the capstan gear.

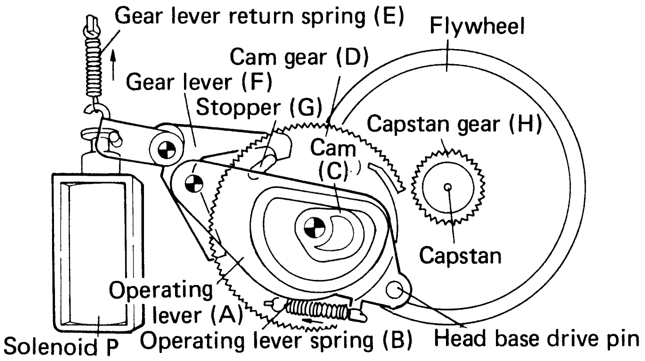

Gear lever return spring (E)
Flywheel
Cam gear (D)
Gear lever (F)
Stopper (G)
Capstan gear (H)
Cam
(C)
Capstan
Operating
lever (A)
Solenoid P
Operating lever spring (B)
Head base drive pin

Fig. 7-1 Playback mode 1 (STOP mode)

● Start of Playback Mode (Fig. 7-2)

1. Solenoid P is activated ❶, and the gear lever (F) hood is released from the stopper (G) ❷.
2. The operating lever (A) presses down on the cam (C) under pressure of the operating lever spring (B) ❸, the cam gear (D) rotates ❹ and engages the capstan gear (H) ❺.

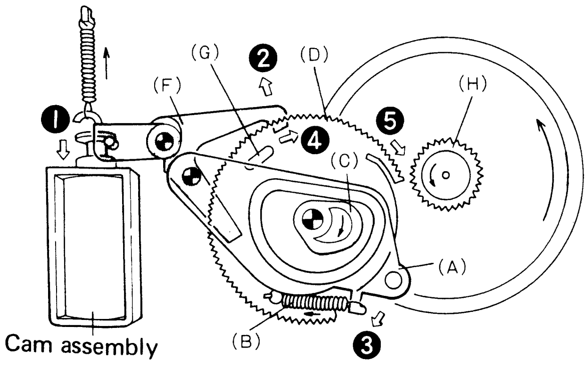

(G)
❷
(D)
(F)
(H)
❶
❺
❹
(C)
(A)
Cam assembly
(B)
❸

Fig. 7-2 Playback mode 2 (STOP PLAY)

● Start of Playback Mode (Fig. 7-3)

3. The cam gear (D) continues to rotate due to rotation of the capstan gear (H) ❻, resulting in the cam (C) pushing the operating lever (A) upwards ❼.
4. Once the cam (C) has passed the position of maximum upward thrust, the cam gear (D) disengages from the capstan gear (H) ❽.

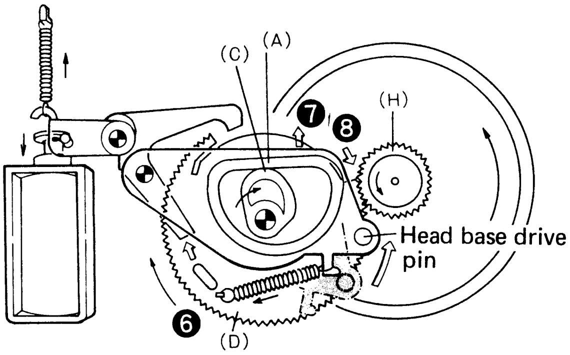

(C)
(A)
(H)
❼
❽
Head base drive pin
❻
(D)

Fig. 7-3 Playback mode 3 (STOP PLAY)

● Start of Playback Mode (Fig. 7-4)

5. Due to the operating lever spring (B), the operating lever (A) presses against the cam (C) ❾, resulting in the stopper (G) meeting the arm of the gear lever (F) ❿. The cam gear (D) is thereby stopped, and the operating lever (A) remains in that position (playback mode).

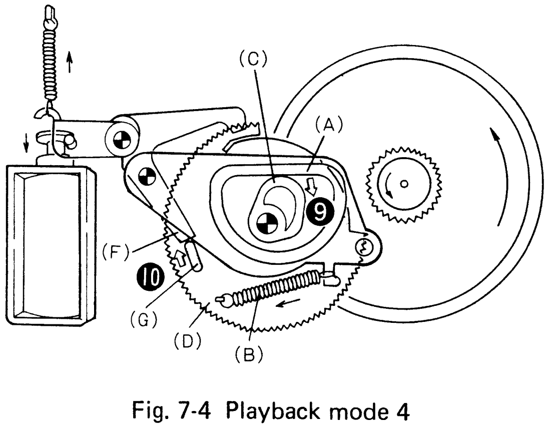


Fig. 7-4 Playback mode 4

• General Mechanism Movements

The operating lever (A) head base pin is raised during playback mode (see Fig. 7-3), thereby lifting the head base through the action of the HB drive spring. At the same time, the pinch pressure spring is also raised, thereby pressing the pinch roller against the capstan. And since the brake plate is also lifted, the reel brake is released, resulting in pressure being applied to the idler arm, and the TU idler thereby transferring the drive gear rotation to the TU reel (this drive gear being belt-driven by the capstan motor). (See Fig. 7-5).

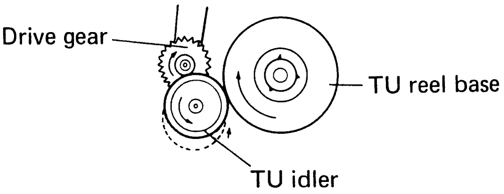

Drive gear
TU reel base
TU idler

Fig. 7-5 Generation of take-up torque (Playback mode)

• Stopping of Playback Mode (Fig. 7-6)

1. When solenoid P is released ⓫ , the arm of the gear lever (F) is released from the stopper (G) by the gear lever return spring (E) ⓬ .
2. The operating lever (A) is then forced againsts the cam (C) by the operating lever spring (B) ⓭ , resulting in the cam gear (D) turning ⓮ and the head base drive pin being lowered ⓯ .
3. When the stopper (G) catches against the hook of the gear lever (F), the mechanism stops in the same state as outlined in Fig. 7-1 (stop mode).

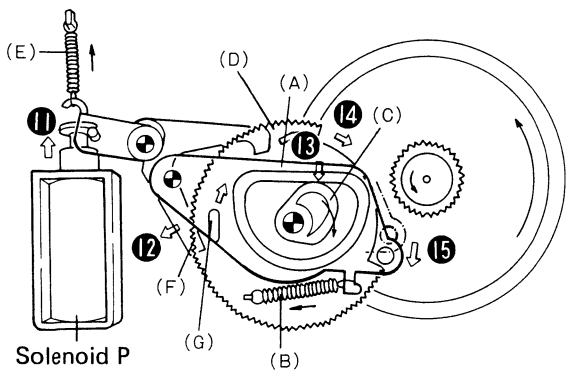

(E)
(D)
(A)
⓫
⓮
(C)
⓭
⓬
⓯
(F)
(G)
(B)
Solenoid P

Fig. 7-6 Playback mode 5 (PLAY STOP)

Fast Forward Mode

When solenoid F is activated in Fig. 7-7, the drive arm is moved to the right, and the drive gear on the arm engages the idler gear, resulting in rotation of the TU reel (the drive gear being belt-driven by the capstan motor). At the same time, the drive gear arm bracket pin pushes the break plate up, thereby releasing the reel brake.

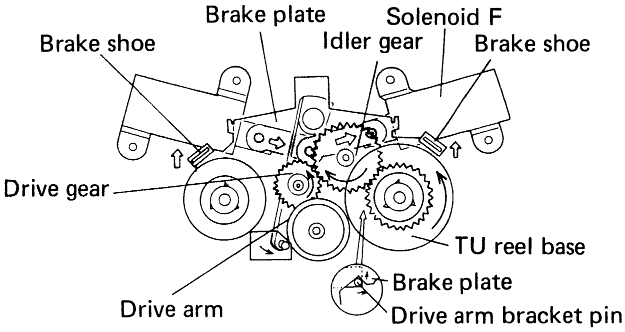

Brake plate
Solenoid F
Brake shoe
Idler gear
Brake shoe
Drive gear
TU reel base
Brake plate
Drive arm
Drive arm bracket pin

Fig. 7-7 Fast forward mode

Rewind Mode

When solenoid R in Fig. 7-8 is activated, the drive arm is moved to the left, and the drive gear on the arm engages the supply reel gear, resulting in rotation of the supply reel. At the same time, the pin at the tip of the drive arm presses the brake plate up, thereby releasing the reel brake.

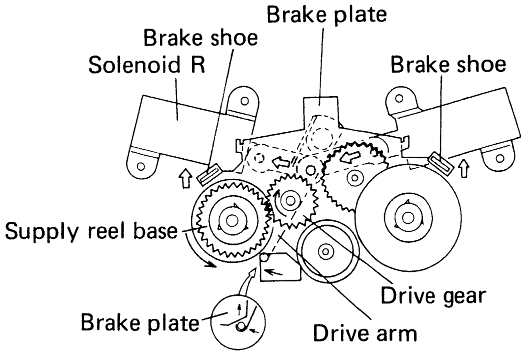

Brake plate
Brake shoe
Solenoid R
Brake shoe
Supply reel base
Drive gear
Brake plate
Drive arm

Fig. 7-8 Rewind mode

7.2 TURNTABLE SECTION

The tonearm movements (auto lead-in and auto return) in the MX-80 make use of the rotational force of the turntable platter.

Auto Lead-In

The turntable mechanism in the stationary state is outlined in Fig. 7-9. For details on the circuit operations of the solenoid, S25 microswitch and the S24 slide switch, refer to section "6.5 Turntable Mechanism Control Stage".

When the START/CUT button is pressed, the solenoid is pulled in the direction of the arrow (see Fig. 7-10), resulting in start up of the turntable platter. This also moves the detector lever unit in the same direction (see arrow) across to the starting plate assembly which is subsequently forced across to the shaft bearing assembly. And since the shaft bearing assembly is rotating, engaging the starting plate assembly results in the cam assembly being turned in the direction of the arrow. Once the cam assembly starts to turn, the drive plate assembly coupled to the cam assembly is moved in the direction of the arrow shown in Fig. 7-11. As result of this movement, S25 is switched to the "b" position (see Fig. 6-5), and then the arm elevation pin is pushed up, thereby lifting the tonearm. At much the same time as this tonearm elevation movement, S24 is also switched to the "b" position (again see Fig. 6-5). Once the tonearm has been raised, the lead-in latch catches pin A on the PU plate mounted to the base of the tonearm. At this time, the drive plate assembly also shifts the index cam in the direction indicated in Fig. 7-11.

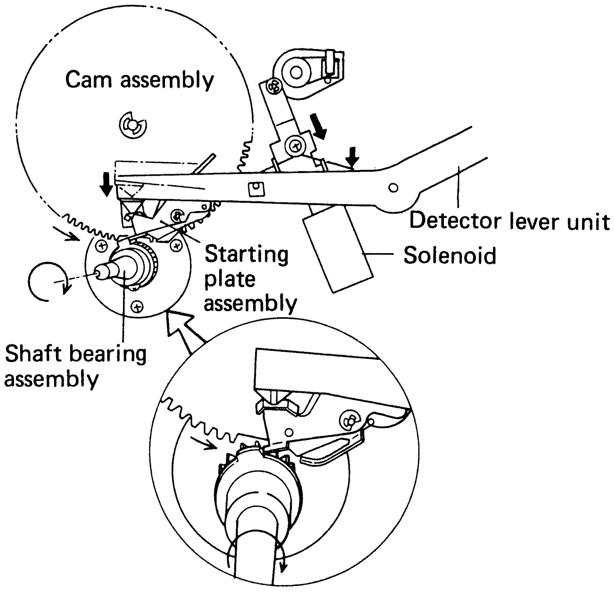

Cam assembly
Detector lever unit
Solenoid
Starting plate assembly
Shaft bearing assembly

Fig. 7-10 Auto lead-in operation 1

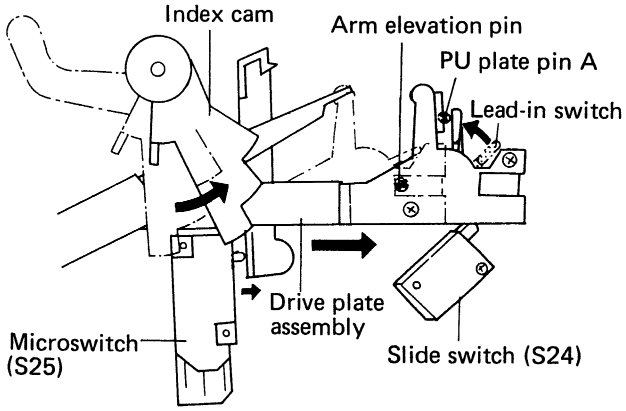

Index cam
Arm elevation pin
PU plate pin A
Lead-in switch
Drive plate assembly
Microswitch (S25)
Slide switch (S24)

Fig. 7-11 Auto lead-in operation 2

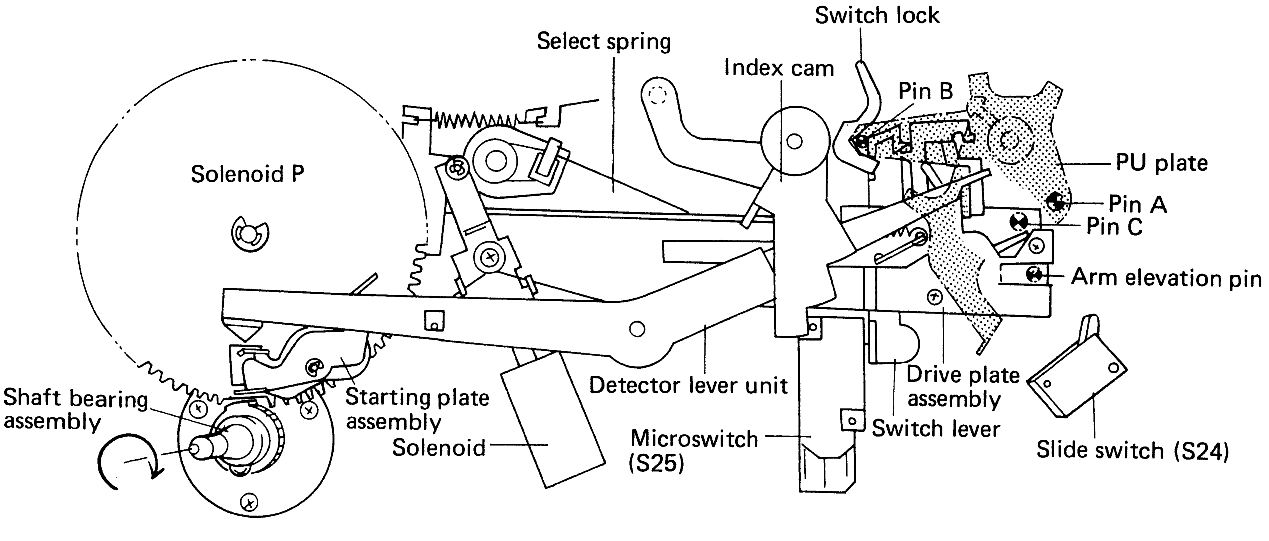
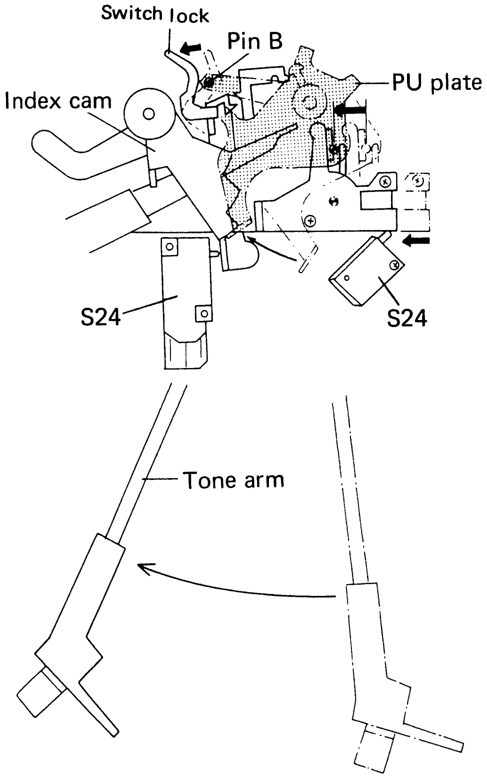

Switch lock
Select spring
Index cam
Pin B
Solenoid P
PU plate
Pin A
Pin C
Arm elevation pin
Shaft bearing assembly
Starting plate assembly
Solenoid
Detector lever unit
Microswitch (S25)
Drive plate assembly
Switch lever
Slide switch (S24)

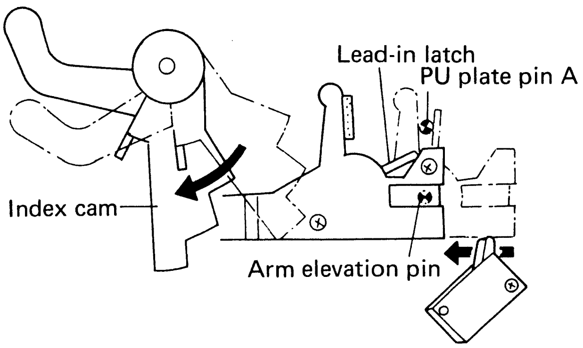
Fig. 7-9 Turntable mechanism (Stationary state)

As the cam assembly continues to rotate, the direction of the drive plate assembly movement is reversed, resulting in the index cam being stopped, and the tonearm being moved across to the record (see Fig. 7-12). When the PU plate meets the index cam, tonearm movement stops, and the switch lock is moved as shown in Fig. 7-12 by pin B on the PU plate. Upon further movement of the drive plate assembly, the lead-in latch is opened, pin A of the PU plate released, and the tonearm is lowered while the index cam is moved in the direction of the arrow shown in Fig. 7-13. The S25 switch is kept in the "b" position by the switch lock movement, while S24 is switched back to the "a" position. Record play subsequently begins.

Note:
The solenoid release time differs according to the SIZE button position (17cm or 30cm). When in the 30cm position, the solenoid is released when S24 is switched from "a" to "b", while when in the 17cm position, the solenoid is released when S24 is switched from "b" to "a". By changing the solenoid release time, the index cam stopping position can be changed, thereby changing the position where the PU plate and index cam meet. In this way, the tonearm lead-in position can be readjusted (see Fig. 7-14).


Switch lock
Pin B
PU plate
Index cam
S24
S24
Tone arm

Auto lead-in operation 3


Lead-in latch
PU plate pin A
Index cam
Arm elevation pin

Auto lead-in operation 4

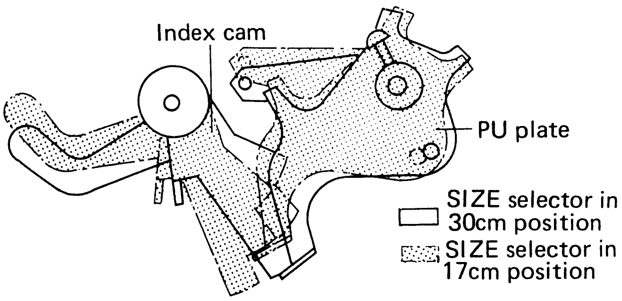
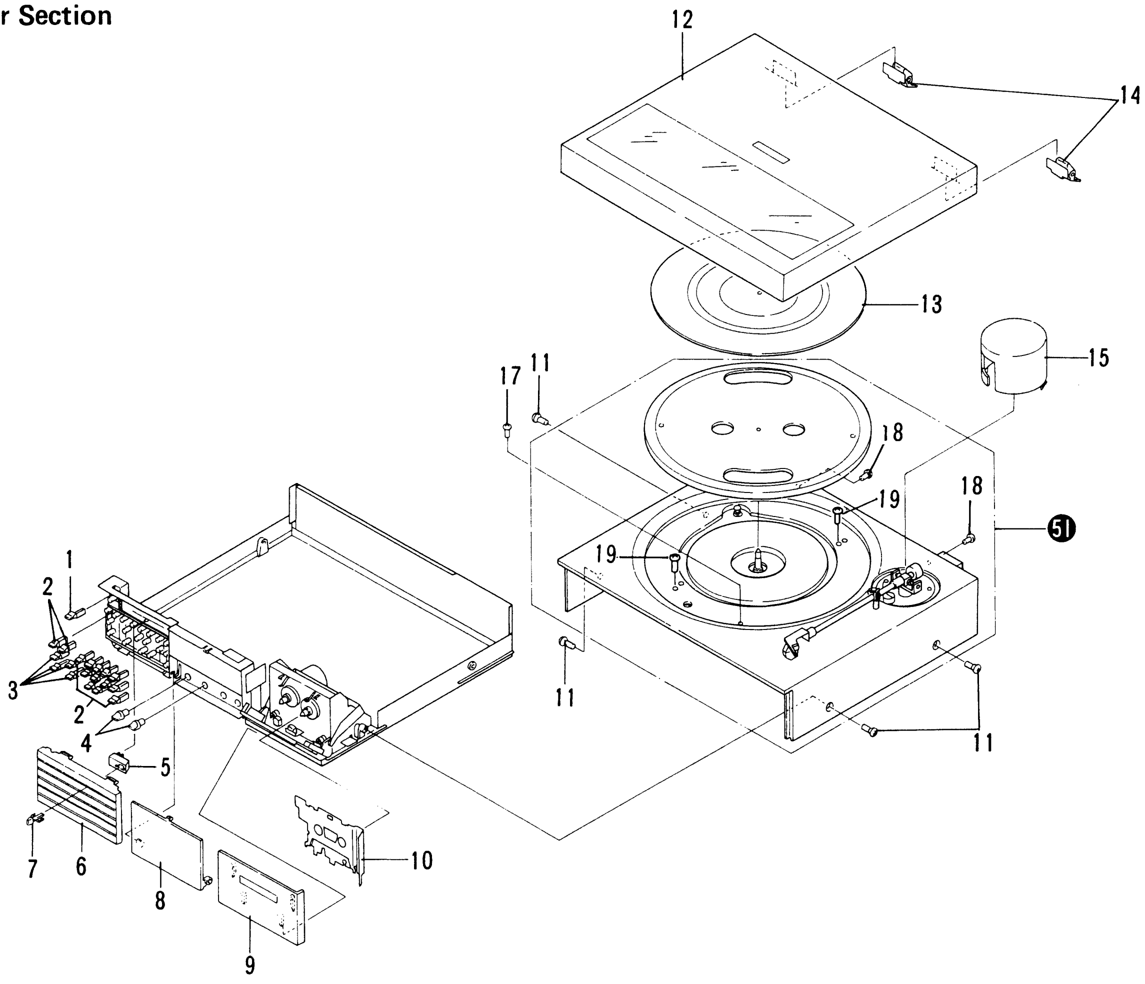

Index cam
PU plate
□ SIZE selector in 30cm position
▨ SIZE selector in 17cm position

Fig. 7-14 Index cam movement

8. EXPLODED VIEW AND PARTS LIST

Exterior Section



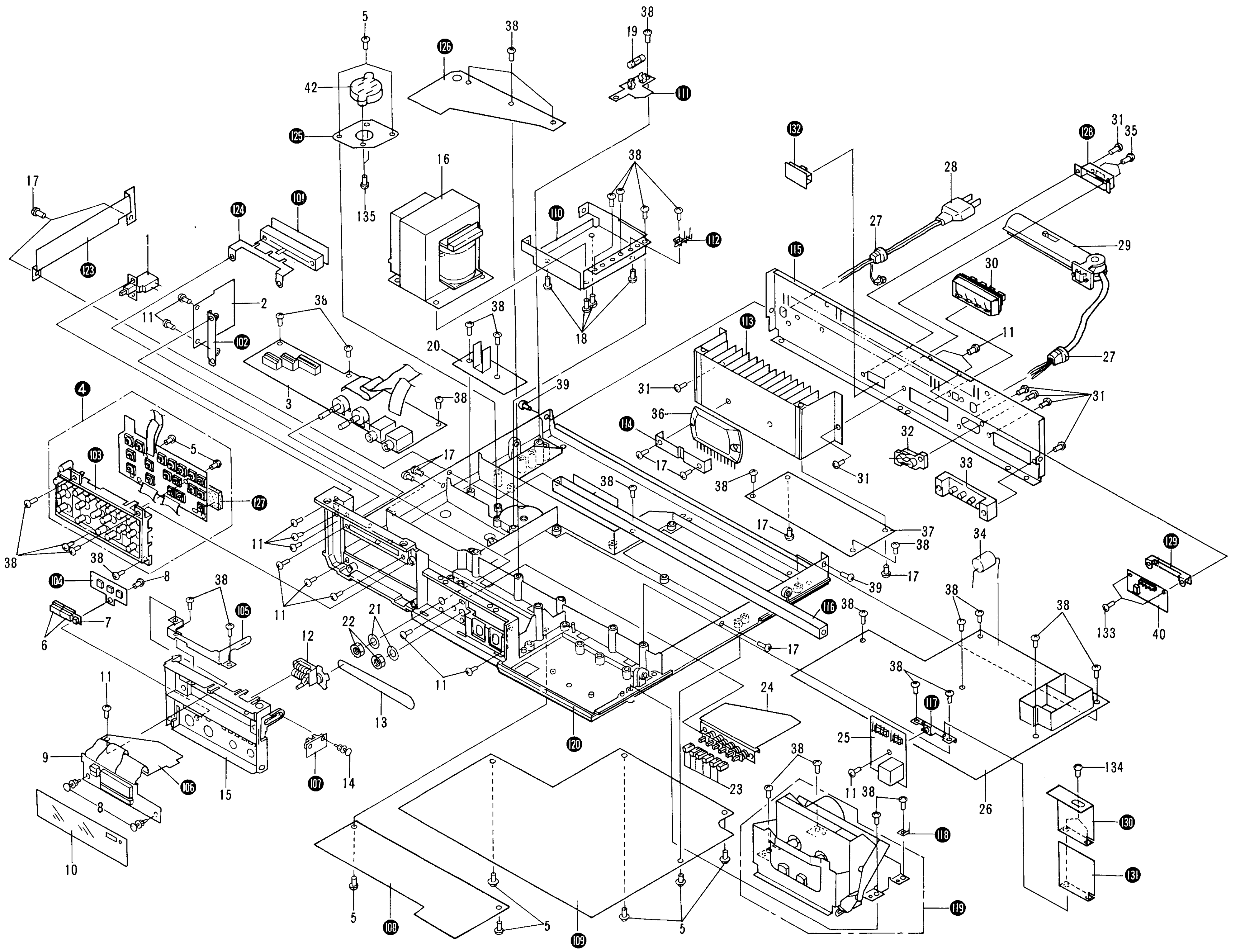
NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number , temperature, humidity, etc.

Parts List

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	AAD-378	Push botton (G)		11.	ANL-011	Dress screw
	2.	AAD-380	Push button (J)		12.	ANR-390	Dust cover assembly
	3.	AAD-379	Push button (H)		13.	PEA-051	Rubber sheet assembly
	4.	AAB-247	Knob (BALANCE, MIX LEVEL)		14.	AXA-285	Hinge assembly
	5.	AEC-735	Shift arm		15.	ANR-256	Arm cap
	6.	ANM-001	Front grill		16.	ANR-375	Sub panel assembly
	7.	AAD-254	Knob (VOLUME)		17.	VPZ30P120FMC	Screw
	8.	ANB-936	Acrylic door		18.	BBZ30P100FZK	Screw
	9.	ANB-951	Cassette door assembly		19.	TMZ50P350FMC	Screw
	10.	ANH-630	Dress plate				
					51.		Turntable assembly

Interior Section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Parts List

Mark N

⚠ ★★

⚠ ★

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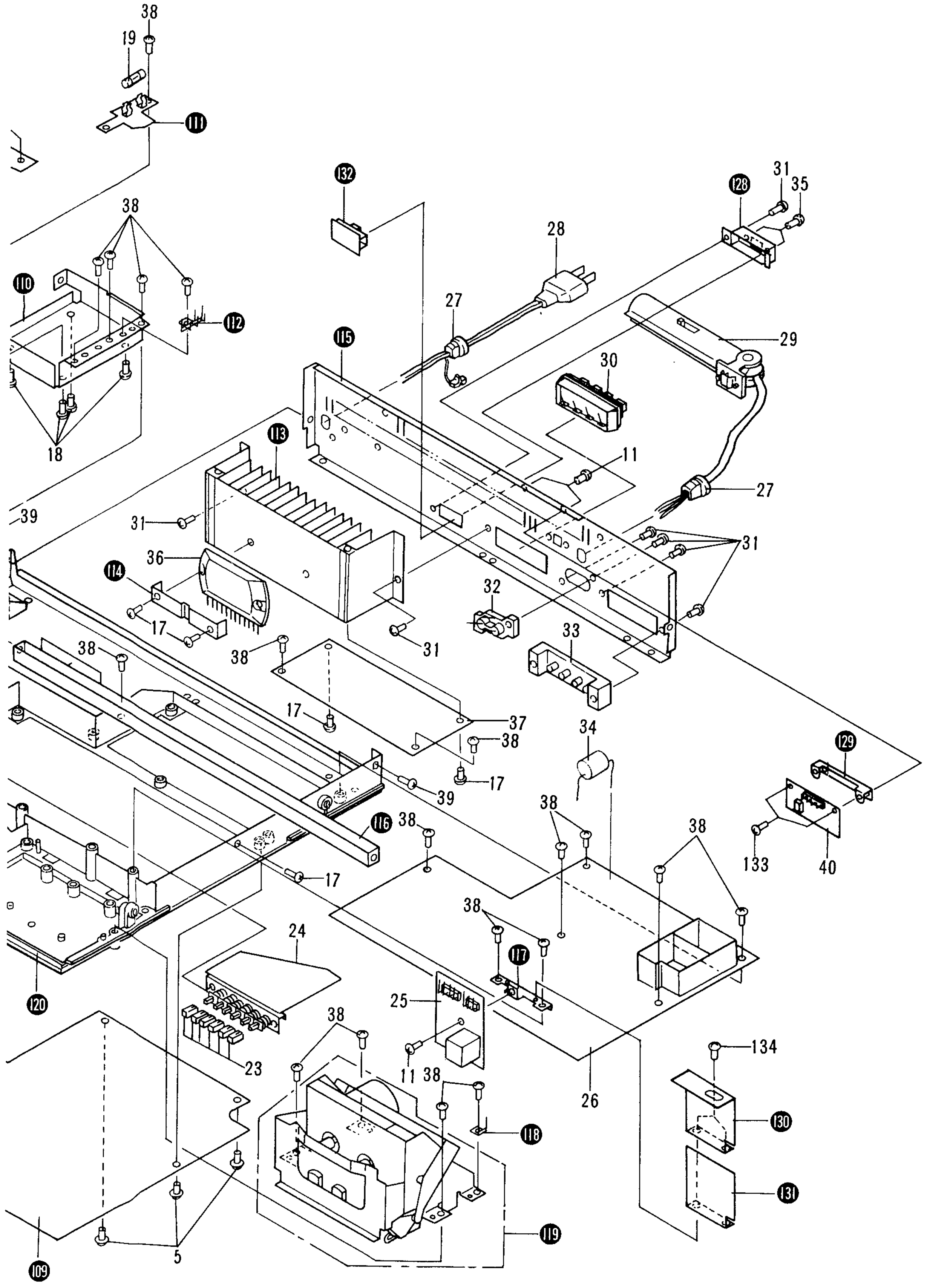
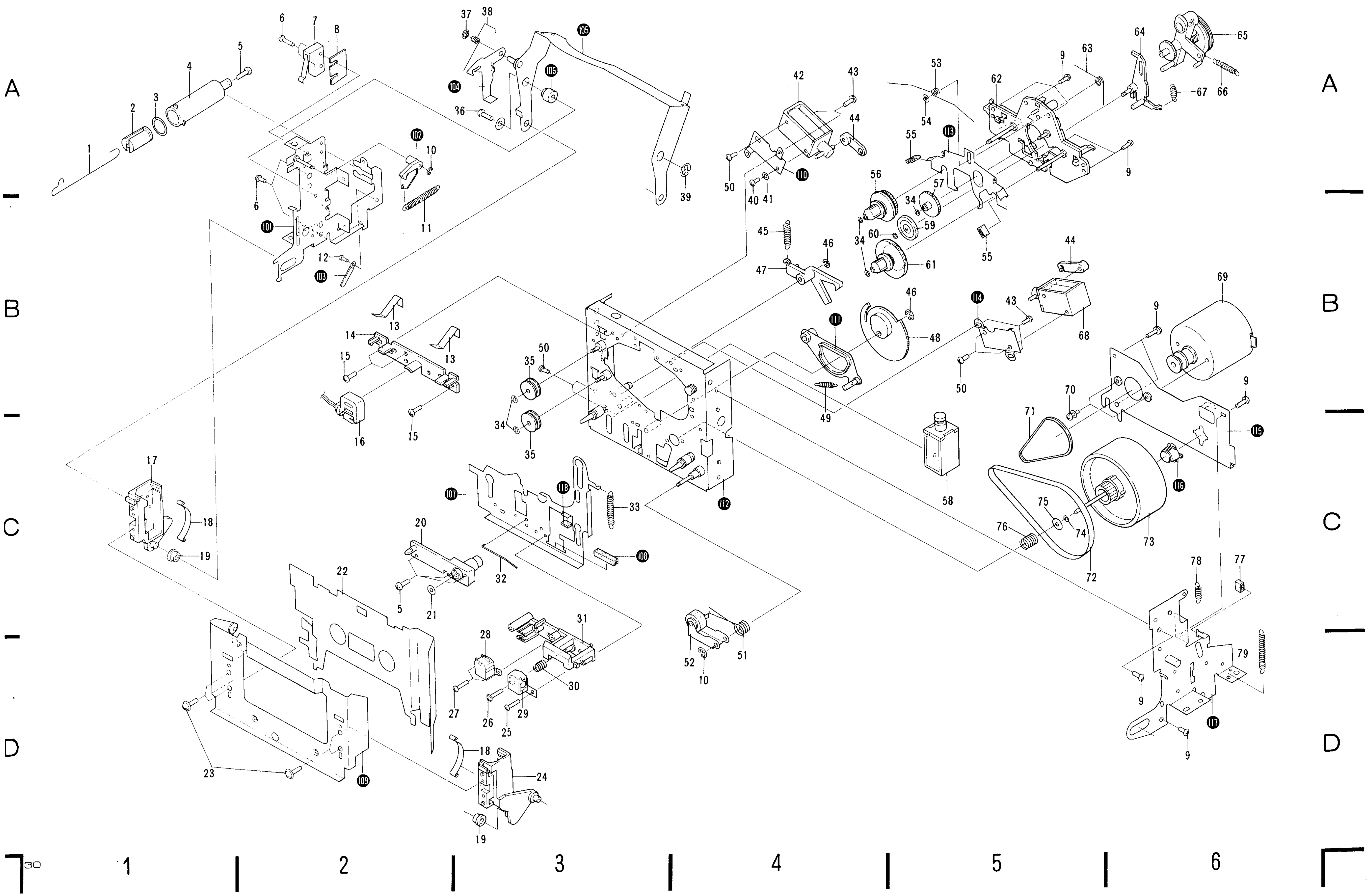


A
B
C
D

Parts List

Mark	No.	Part No.	Description
⚠ ★★	1.	ASG-523	Push switch (POWER)
	2.	GWX-627	Logic assembly
	3.	GWM-193	Control assembly
	4.		Switch assembly
	5.	VPZ30P080FMC	Screw
	6.	AAD-258	Push button (D)
	7.	AAD-259	Push button (E)
	8.	AEC-441	Rivet
	9.	GWX-628	Frequency display assembly
	10.	AAG-235	Scale
	11.	PMZ30P080FZK	Screw
	12.	AAW-130	Counter
	13.	AEB-180	Counter belt
	14.	AEC-238	Rivet
	15.	ANR-375	Sub panel assembly
⚠ ★	16.	ATT-838	Power transformer (110V, 120V, 220V, 240V)
	17.	VBZ30P080FMC	Screw
	18.	BMZ40P080FMC	Screw
⚠ ★★	19.	AEK-101	Fuse (3A)
	20.	GWR-157	Power supply assembly
	21.	WA92F140U050	Washer
	22.	NK90FUC	Nut
	23.	AAD-260	Push button (F)
	24.	AWX-210	Switch assembly
	25.	GWX-623	OSC block assembly
	26.	GWM-206	AF, RF assembly
⚠	27.	AEC-327	Strain relief
⚠	28.	ADG-046	AC cord
	29.	ATB-631	Bar antenne
	30.	AKE-051	Terminal (SPEAKERS)
	31.	BBT30P080FZK	Screw
	32.	AKB-056	Terminal (TV/AUX)
	33.	AKA-014	Terminal (ANTENNA)
	34.	AEX-007	Nickel-cadmium battery
	35.	BMZ30P040**FZK**	Screw
⚠	36.	SI-1125HDP	IC
	37.	AWH-106	Power amplifier assembly
	38.	VPZ30P100FMC	Screw
	39.	BBZ30P100FZK	Screw
	40.	AWM-311	Protection assembly
	41.	ABA-176	Tapping screw
⚠	42.	AKX-063	Voltage selector
	101.		Volume assembly
	102.		Bracket A
	103.		LED house
	104.		Switch assembly
	105.		Bracket B
	106.		Frequency-display drive assembly
	107.		Sensor assembly
	108.		Bottom plate (A)
	109.		Bottom plate (B)
	110.		Bracket
	111.		Fuse assembly
	112.		Terminal 7P (GND)
	113.		Heat sink
	114.		Holder
	115.		Rear panel
	116.		Frame
	117.		Bracket C
	118.		Terminal 2P (GND)
	119.		Mechanism assembly
	120.		Bottom case assembly
	121.	....	....
	122.	....	....
	123.		Shield plate
	124.		Earth plate
	125.		Select plate
	126.		Cover
	127.		Cushion
	128.		Switch box
	129.		Holder
	130.		Shield plate
	131.		Insulator sheet
	132.		AM step-selector assembly
	133.	PMZ30P080FMC	Screw
	134.	VPZ30P060FMC	Screw
	135.	BTZ30P080FMC	Screw

Cassette Mechanism Section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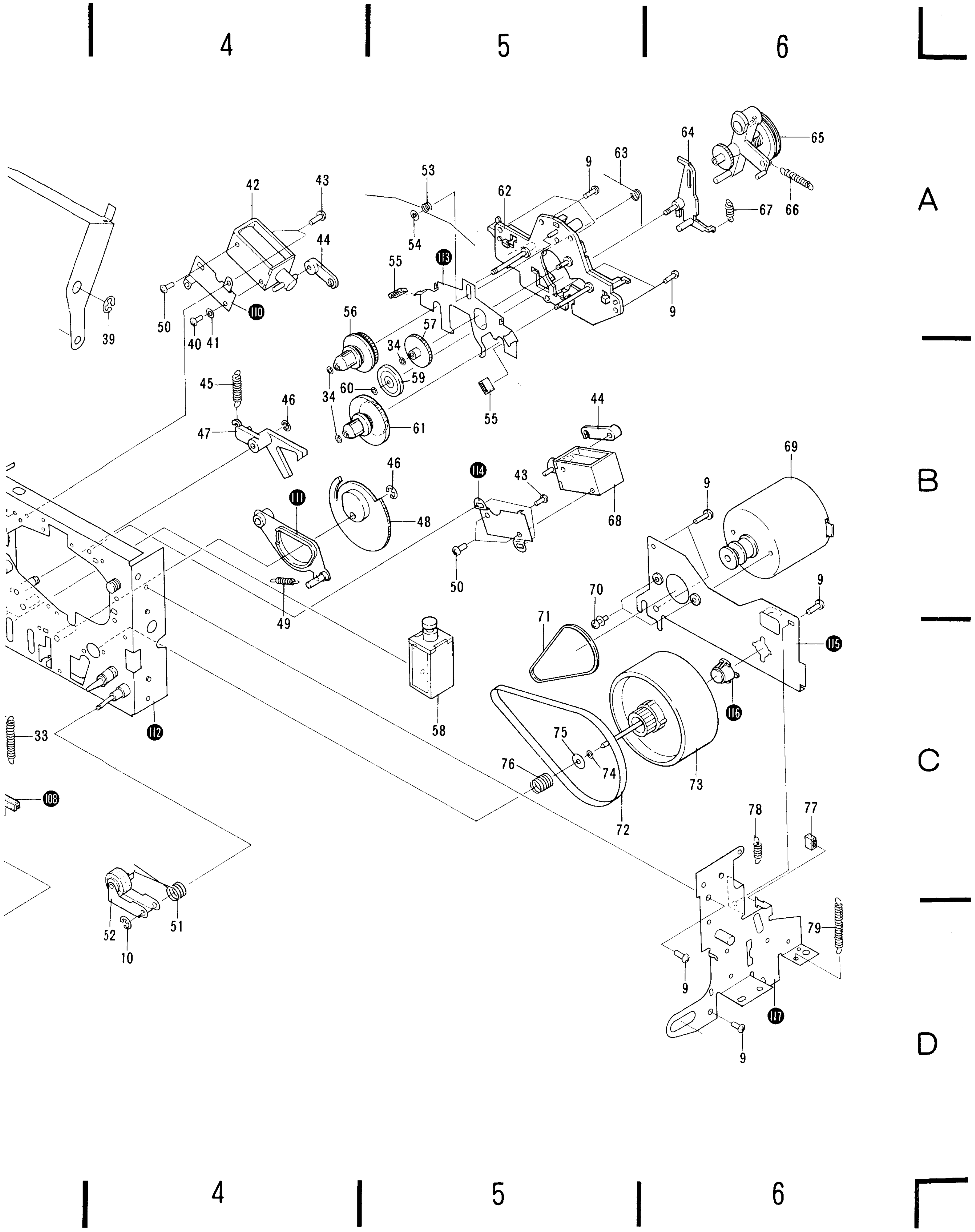
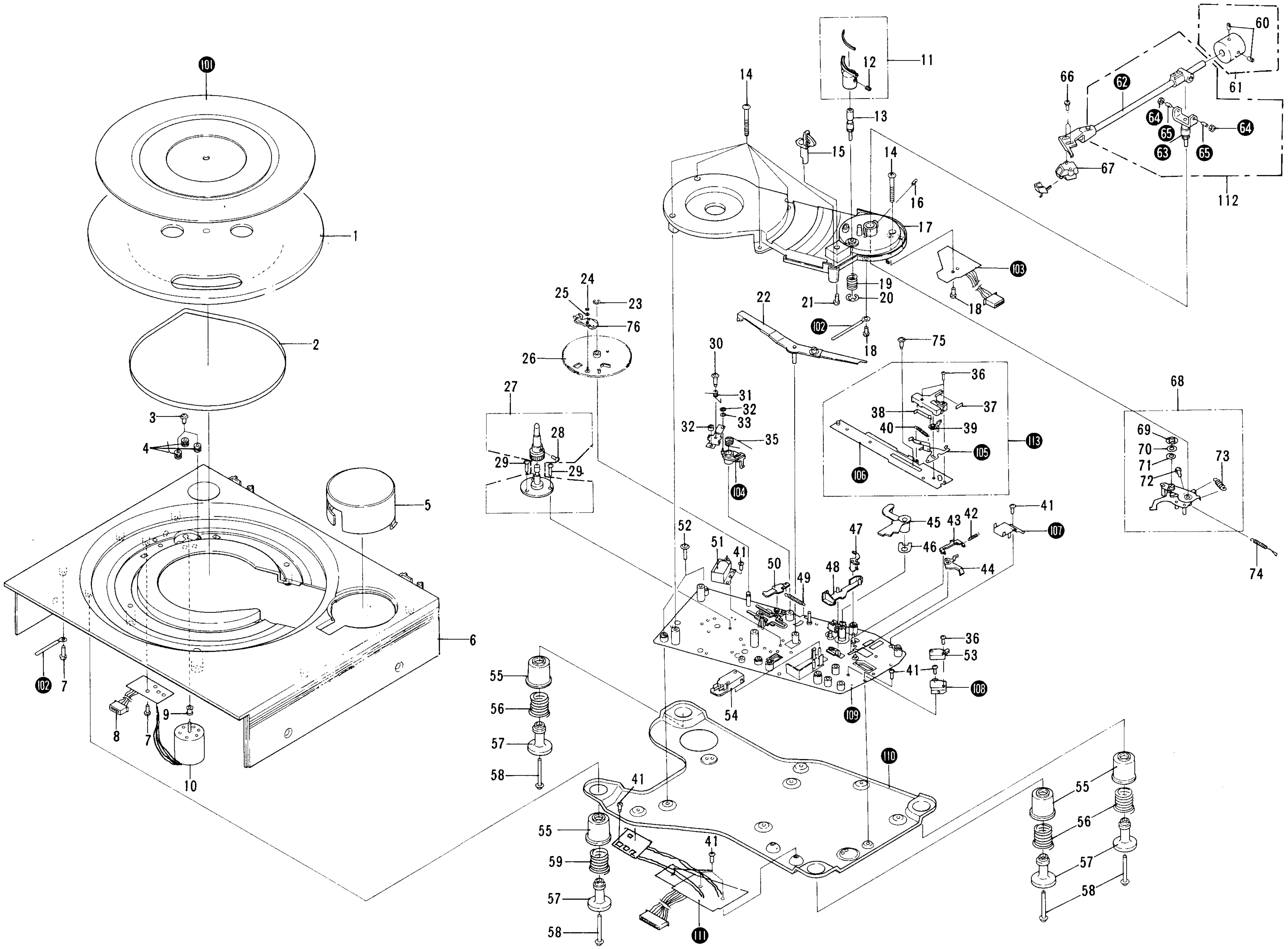
Parts
Mark



Parts List

Mark	No.	Part No.	Description
	1.	RBH-793	Connection rod M
	2.	RNL-053	Piston
	3.	REB-447	O ring
	4.	RNK-995	Cylinder
	5.	VCZ26P090FMC	Screw
	6.	BMZ20P100FMC	Screw
★★	7.	RSF-031	Micro switch
	8.	REC-278	Switch spacer
	9.	UCZ26P060FMC	Screw
	10.	YE20FUC	Washer
	11.	RBH-829	REC detector spring
	12.	VCZ26P040FMC	Screw
	13.	RNF-895	Half receptacle spring
	14.	RNL-042	Half receptacle
	15.	PCZ26P060FMC	Screw
	16.	AEL-151	Lamp assembly (8V 150mA)
	17.	RNL-180	Pocket (L)
	18.	RBK-162	Pocket spring
	19.	RNK-994	Guide roller
	20.	RXB-359	Bearing holder assembly
	21.	RBF-050	Washer (oil stopper)
	22.	ANH-630	Dress plate
	23.	BBK26P080FBK	Screw
	24.	RNL-237	Pocket (R)
	25.	PMZ20P120FMC	Screw
	26.	IMZ20Y120FMC	Screw
	27.	PMZ20P130FMC	Screw
★	28.	RPB-088	Erase head
★★	29.	RPB-089	REC/P.B. head
	30.	RBH-723	Head adjust spring
	31.	RNL-222	Sub head base
	32.	RBH-782	Head base drive spring
	33.	RBH-741	Head base return spring
	34.	WA17D032D025	Washer
	35.	RNK-292	BT pulley
	36.	PMF30P120FMC	Screw
	37.	YS24FBT	Washer
	38.	RBH-792	Lock spring
	39.	YE40FUC	Washer
	40.	BMZ26P040FMC	Screw
	41.	WC25FUC	Washer
★	42.	RXP-094 (RXP-104)	Plunger solenoid
	43.	PMZ26P060FMC	Screw
	44.	RNL-047	Solenoid arm
	45.	RBH-722	Gear lever return spring
	46.	YE30FUC	Washer
	47.	RNL-051	Gear lever
	48.	RNL-059	Cam gear
	49.	RBH-842	Lever spring
	50.	PMZ26P030FMC	Screw
	51.	RBH-760	Pressure spring
★★	52.	RXB-495	Pinch arm assembly
	53.	RBH-727	Brake spring
	54.	YS20FBT	Washer
	55.	REB-187	Brake shoe
	56.	RXB-377	Supply reel base assembly
	57.	RNK-998	Idler gear
★	58.	RXP-092 (RXP-102)	Plunger solenoid P
★★	59.	RNK-999	TU idler
	60.	WA17D032D025	Washer
★★	61.	RXB-360	TU reel base assembly
★★	62.	RXB-378	Reel base assembly
	63.	RBH-725	FR spring
	64.	RXB-374	Idler arm assembly
	65.	RXB-376	Drive arm full assembly
	66.	....	....
	67.	RBH-724	Idler pressure spring
★★	68.	RXP-093 (RXP-103)	Plunger solenoid F
★★	69.	RXM-076	Motor assembly
	70.	PMA26P040FMC	Screw
	71.	REB-446	Drive belt
★★	72.	REB-411	Capstan belt
	73.	RXB-358	Flywheel assembly
	74.	WA21D040D025	Washer
	75.	RBF-051	Washer
	76.	RBH-721	Flywheel spring
	77.	REB-187	Brake shoe
	78.	RBH-789	Absorb spring
	79.	RBH-788	Pocket return spring
	101.		Side plate (L) assembly
	102.		REC detector lever
	103.		UL cord clamper
	104.		Lock plate
	105.		Connection arm M assembly
	106.		Shaft
	107.		Head base
	108.		Shaft stopper
	109.		Door frame assembly
	110.		Solenoid bracket L
	111.		Action lever assembly
	112.		Chassis assembly
	113.		Brake plate
	114.		Solenoid bracket R
	115.		Flywheel receptacle
	116.		Trust receptacle
	117.		Side plate (R) assembly
	118.		BT felt

Turntable Section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Parts List

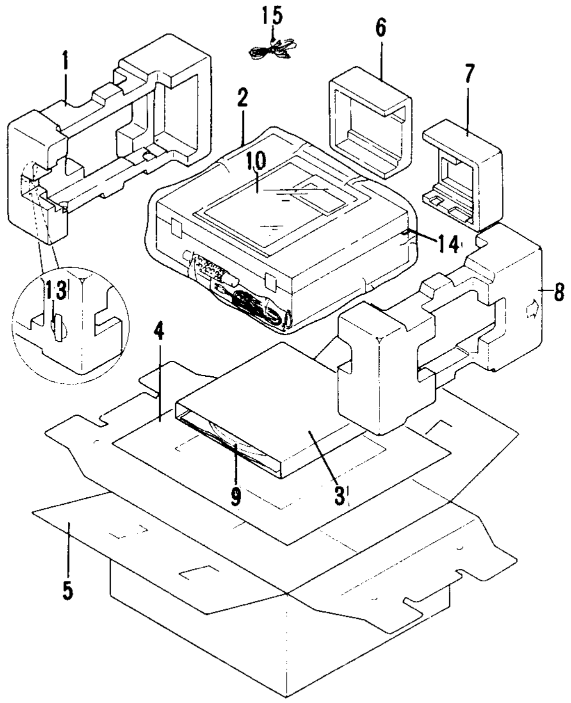
Mark No.

★★

Parts List

Mark	No.	Part No.	Description
	1.	PNR-147	Turntable
	2.	KEB-004	Belt
	3.	PBA-112	Motor retaining screw
	4.	PEB-172	Rubber
	5.	ANR-256	Arm cap
	6.	PNX-205	Case
	7.	PPZ30P080FMC	Screw
	8.	PDE-093	Connector assembly (C)
	9.	PLM-002	Motor pulley
★★	10.	NXM-001	Motor assembly
	11.	PXB-203	Elevation sheet assembly
	12.	ZMK40M050FZK	Screw
	13.	PLB-089	Shaft
	14.	PBA-108	Screw
	15.	PXB-192	Arm rest assembly
	16.	ZMD40H080FBT	Screw
	17.	PNX-162	Arm base
	18.	VBZ30P080FMC	Screw
	19.	PBH-237	EV spring
	20.	YE70S	Washer
	21.	IPZ30P100FMC	Screw
	22.	PTX-355	Detector lever assembly
	23.	YE40S	Washer
	24.	YE15S	Washer
	25.	WA21D040D025	Washer
	26.	PNX-167	Cam
	27.	PXB-177	Bearing assembly
	28.	PMZ30P040FMC	Screw
	29.	PDZ30P080FMC	Screw
	30.	PBA-115	Screw
	31.	PBH-279	Start spring
	32.	YS20FBT	Washer
	33.	WC20FMC	Washer
	34.	PEB-175	Bush
	35.	PBH-280	Select spring
	36.	PMZ26P100FMC	Screw
	37.	PEC-064	EV cam buffer
	38.	PBK-038	Click spring
	39.	PNX-032	Ratch
	40.	PBH-224	Start plate spring
	41.	PDZ30P050FMC	Screw
	42.	PBH-223	Reset plate spring
	43.	PNX-029	Selector
	44.	PNX-028	Reset plate
	45.	PNX-034	Index cam
	46.	PBK-039	Washer
	47.	PNX-031	Switch locker
	48.	PNX-030	Switch lever
	49.	PBH-225	Lock plate spring
	50.	PNX-035	Lock plate
★	51.	PXP-005	Plunger solenoid
	52.	PBA-109	Screw
	53.	PSH-004	Slide switch
★★	54.	PSF-009	Micro switch
	55.	PEB-163	Damper rubber
	56.	PBH-277	Float spring
	57.	PNX-062	Insulator case
	58.	PBA-099	Insulator retaining screw
	59.	PBH-276	Float spring (A)
	60.	ZMD40M100FNI	Screw
	61.	PNR-145	Weight
	62.		Pipe holder assembly
	63.		Rotary shaft assembly
	64.		Nut
	65.		Pivot
	66.	PBA-905	Cartridge retaining screw (W)
	67.	PXT-910	Cartridge (without stylus)
	68.	PXB-194	PU plate assembly
	69.	YS40FBT	Washer
	70.	WC40FMC	Washer
	71.	PNC-227	PU washer
	72.	PMD40P080FMC	Screw
	73.	PBH-244	PU plate spring
	74.	PBH-728	AS action spring
	75.	PBA-103	Screw
	76.	PYY-058	Start plate assembly
	101.		Rubber sheet
	102.		Cord clamper
	103.		EQ amplifier assembly
	104.		Select pin
	105.		Start plate
	106.		Drive plate assembly
	107.		Protection plate
	108.		Slide switch metal
	109.		Sub panel assembly
	110.		Base
	111.		Function switch assembly
★	112.	PPD-610	Arm assembly
	113.		Drive plate assembly

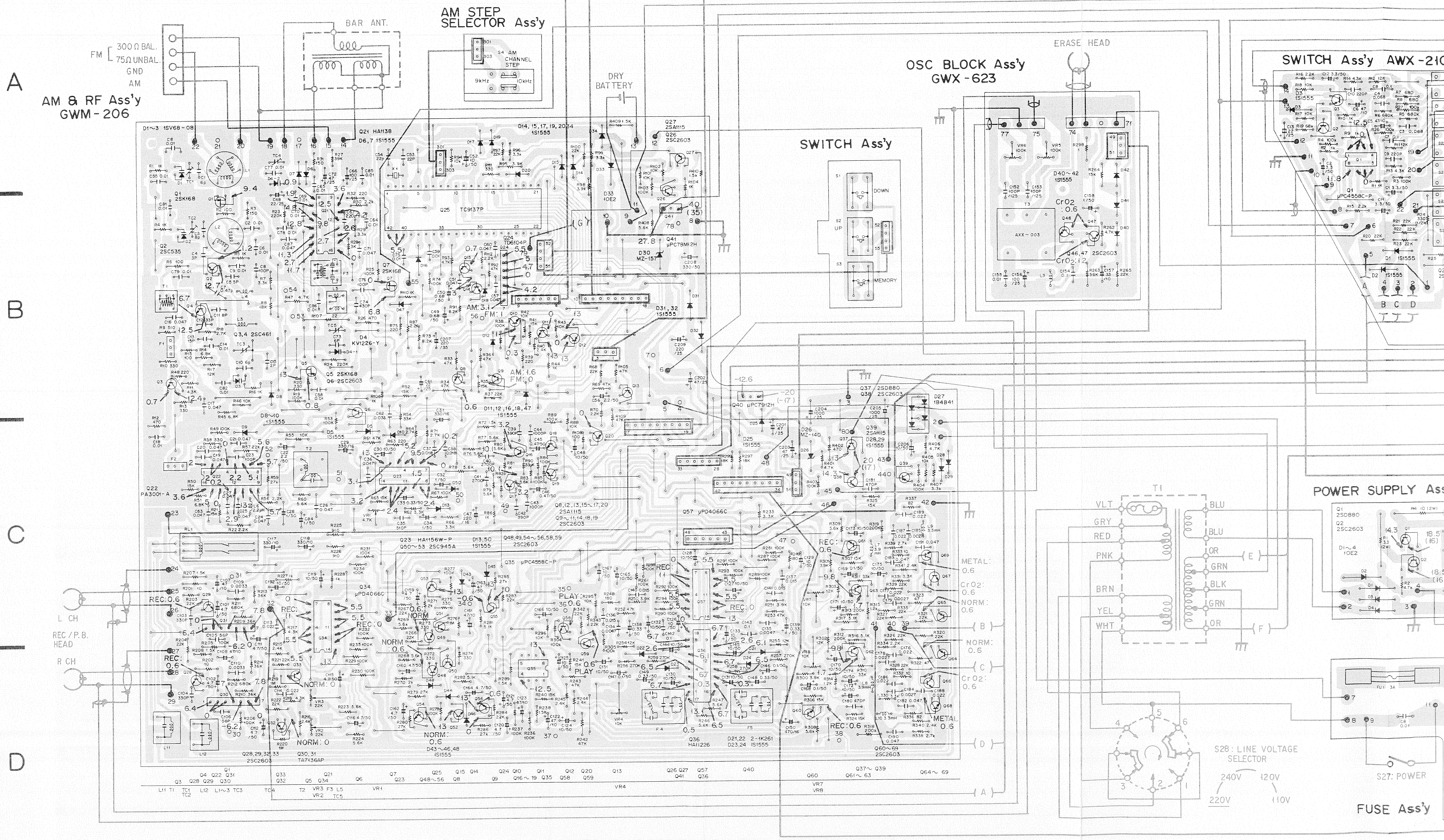
9. PACKING



Parts List

Mark	No.	Part No.	Description
	1.	AHR-272	Side pad R
	2.		Vinyl bag
	3.	HHA-320	Pad
	4.	HNM-159	Spacer
	5.	AHD-956	Packing case
	6.	AHA-274	Corner pad R
	7.	AHA-273	Corner pad L
	8.	AHA-271	Side pad L
	9.		Vinyl bag
	10.	ARE-006	Operating instructions
	11.	....	....
	12.	....	....
	13.	N93-603	45rpm adaptor
	14.	HNM-159	Spacer
	15.	ADH-005	FM antenna

10. P.C. BOARD CONNECTION DIAGRAM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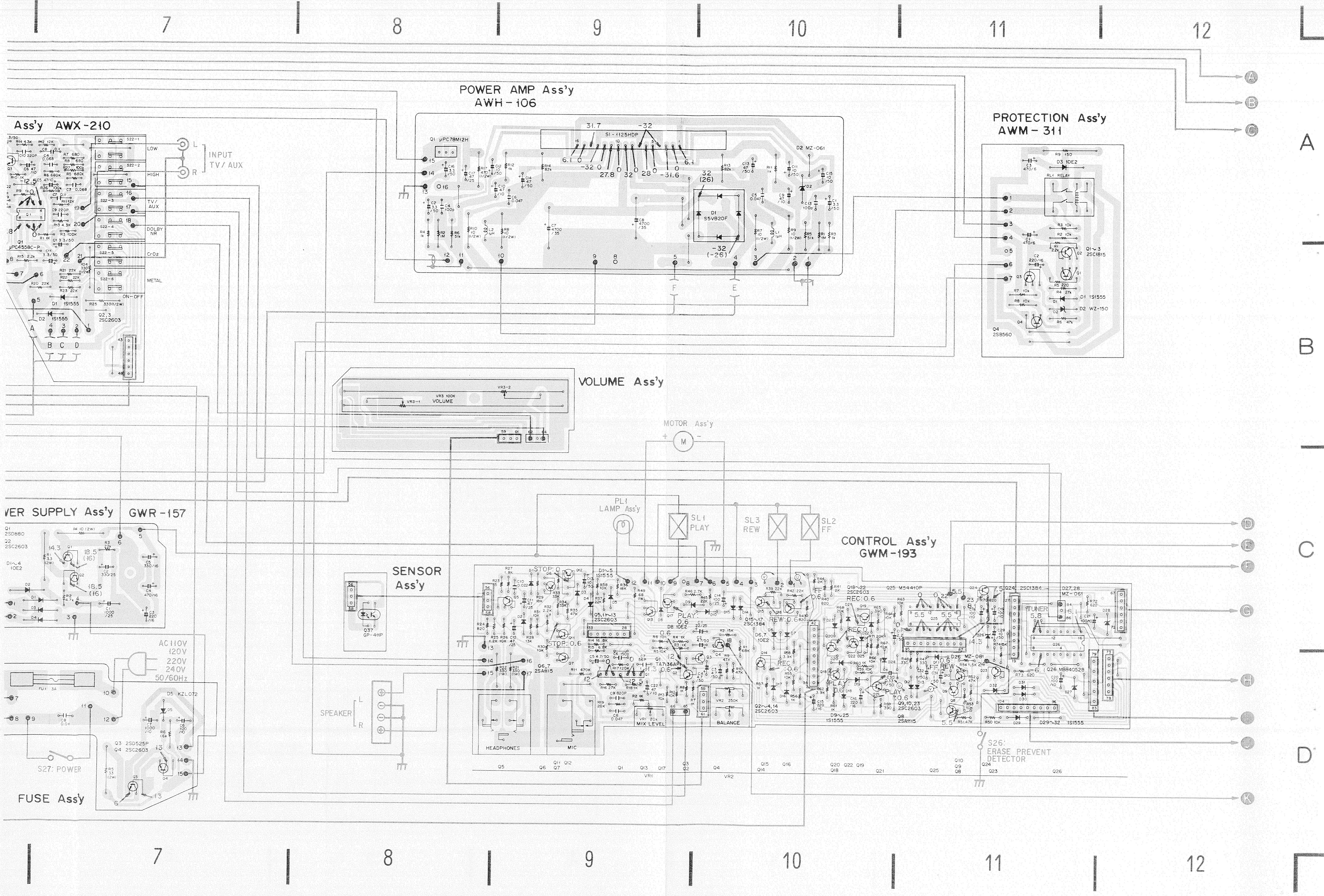
6
A
B
C
D
FM
300 Ω BAL.
75Ω UNBAL.
GND
AM
AM & RF Ass'y
GWM-206
BAR ANT.
AM STEP
SELECTOR Ass'y
S4 AM CHANNEL STEP
9kHz
10kHz
DRY BATTERY
ERASE HEAD
OSC BLOCK Ass'y
GWX-623
SWITCH Ass'y
DOWN
UP
MEMORY
SWITCH Ass'y AWX-210
Q25 TC9137P
Q24 TD6104P
Q41 μPC78M12H
Q40 μPC7912H
Q57 μPD4066C
Q23 HA1156W-P
Q35 μPC4558C-P
Q34 μPD4066C
Q30,31 TA7136AP
Q36 HA11226
Q37 2SD880
Q38 2SC2603
D27 1B4B41
L CH
REC/P.B. HEAD
R CH
REC
PLAY
NORM
METAL
CrO2
T1
VLT
GRY
RED
PNK
BRN
YEL
WHT
BLU
OR
GRN
BLK
POWER SUPPLY Ass'y
S28: LINE VOLTAGE SELECTOR
240V
120V
220V
110V
S27: POWER
FUSE Ass'y


7
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11
12
A
B
C
D
POWER AMP Ass'y
AWH-106
SI-1125HDP
μPC78M12H
D2 MZ-061
D1 S5VB20F
31.7
-32
6.1
27.8
32
28
-31.6
32 (26)
-32 (-26)
PROTECTION Ass'y
AWM-311
RL1 RELAY
D3 10E2
Q1~3 2SC1815
Q4 2SB560
D1 1S1555
D2 WZ-150
Ass'y AWX-210
μPC4558C-P
D1 1S1555
D2 1S1555
Q2,3 2SC2603
LOW
HIGH
TV/AUX
DOLBY NR
CrO2
METAL
ON-OFF
INPUT TV/AUX
L
R
VOLUME Ass'y
VR3 100K VOLUME
VR3-1
VR3-2
MOTOR Ass'y
M
PL1 LAMP Ass'y
SL1 PLAY
SL3 REW
SL2 FF
SENSOR Ass'y
Q37 GP-4HP
CONTROL Ass'y
GWM-193
TA7136AP
Q25 M54410P
Q26 MB84052B
Q18~22 2SC2603
Q24 2SC1384
D27,28 MZ-061
Q5,11~13 2SC2603
Q6,7 2SA1115
Q15~17 2SC1384
Q2~4,14 2SC2603
Q8 2SA1115
Q9,10,23 2SC2603
D9~25 1S1555
D29~32 1S1555
D8 10E2
STOP:0
STOP:0.6
PLAY:0.6
REW:0.6
REC:0.6
FF:0.6
REW
PLAY
TUNER
HEADPHONES
MIC
MIX LEVEL
BALANCE
VR1 20K
VR2 250K
SPEAKER
S26: ERASE PREVENT DETECTOR
WER SUPPLY Ass'y
GWR-157
Q1 2SD880
Q2 2SC2603
D1~4 10E2
AC110V 120V 220V 240V 50/60Hz
FU1 3A
D5 KZL072
Q3 2SD525P
Q4 2SC2603
S27: POWER
FUSE Ass'y
Ⓐ
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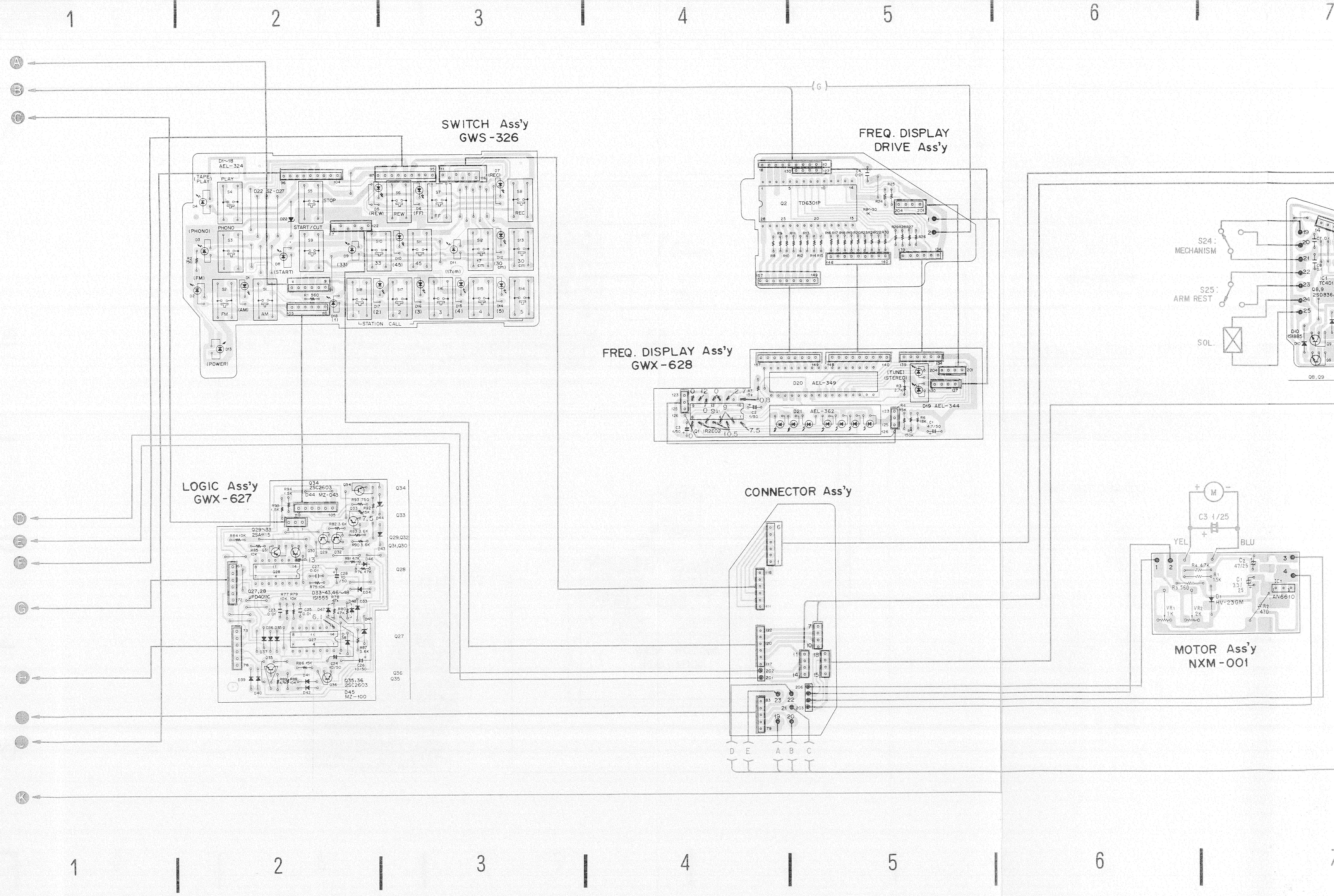

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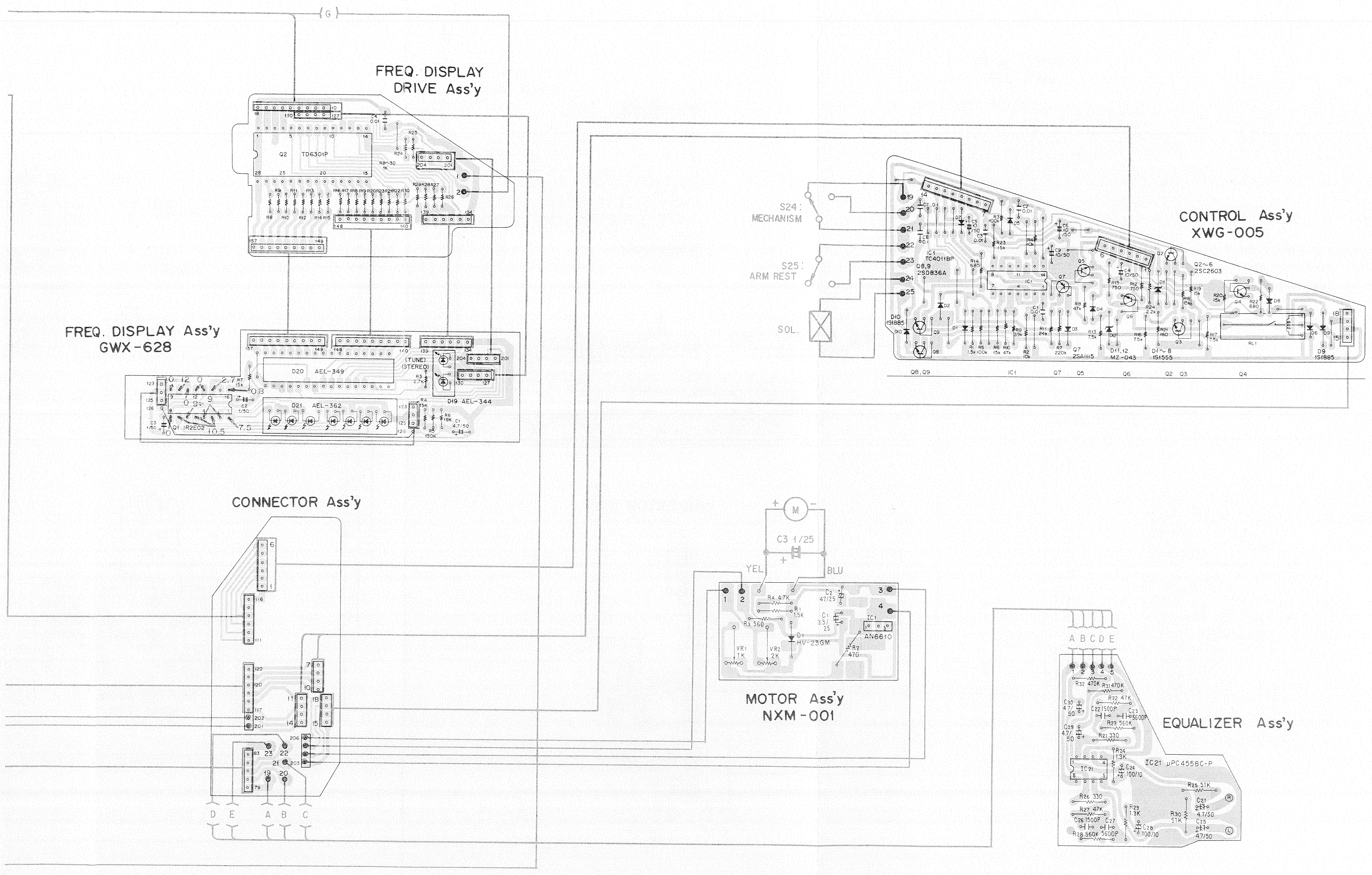
E
F
G
H
I
J
K
(G)
SWITCH Ass'y
GWS-326
D1~18
AEL-324
(TAPE PLAY)
PLAY
STOP
REW
FF
REC
(PHONO)
PHONO
START/CUT
(START)
(FM)
FM
(AM)
AM
(POWER)
STATION CALL
(33)
33
(45)
45
(17cm)
17 cm
(30 cm)
30 cm
FREQ. DISPLAY
DRIVE Ass'y
Q2
TD6301P
FREQ. DISPLAY Ass'y
GWX-628
D20 AEL-349
D21 AEL-362
D19 AEL-344
(TUNE)
(STEREO)
Q1 IR2E02
LOGIC Ass'y
GWX-627
Q34
2SC2603
D44 MZ-043
Q29~33
2SA1115
Q27,28
μPD4011C
D33~43,46~48
1S1555
Q35,36
2SC2603
D45
MZ-100
CONNECTOR Ass'y
D
E
A
B
C
S24 :
MECHANISM
S25 :
ARM REST
SOL.
D10
1S1885
IC1
TC4011
Q8,9
2SD836A
Q8,Q9
M
C3 1/25
YEL
BLU
R4 4.7K
R3 560
VR1
1K
VR2
2K
R2
470
D1
HV-23GM
IC1
AN6610
MOTOR Ass'y
NXM-001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G
FREQ. DISPLAY DRIVE Ass'y
TD6301P
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AEL-349
AEL-362
AEL-344
IR2E02
CONTROL Ass'y XWG-005
S24 : MECHANISM
S25 : ARM REST
SOL.
TC4011BP
2SD836A
2SC2603
2SA1115
MZ-043
1S1555
1S1885
CONNECTOR Ass'y
M
C3 1/25
YEL
BLU
MOTOR Ass'y NXM-001
AN6610
HV-23GM
EQUALIZER Ass'y
IC21 μPC4558C-P
A B C D E
D E A B C

External Appearance of Transistors and ICs

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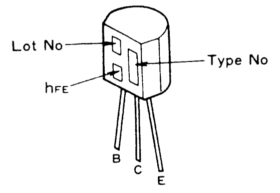
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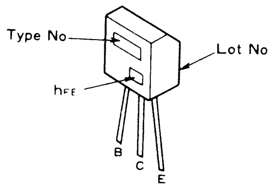
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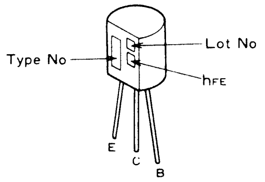
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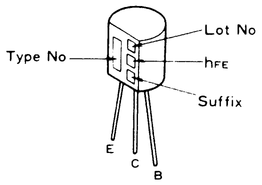
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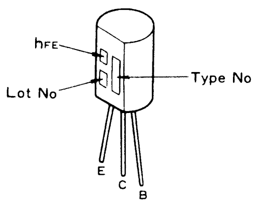
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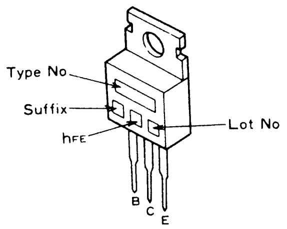
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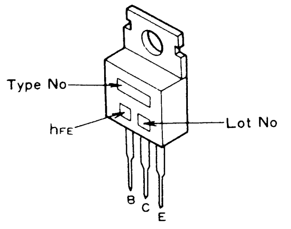
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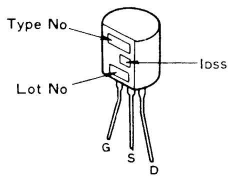
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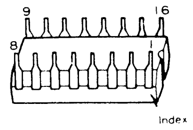
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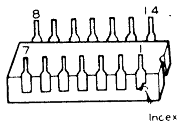
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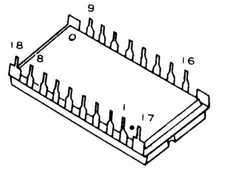

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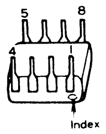

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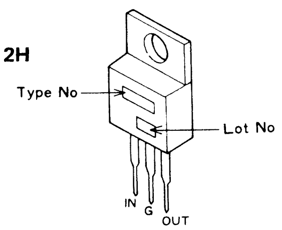
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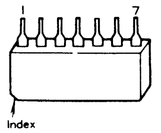

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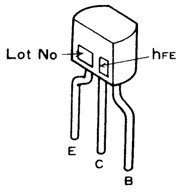
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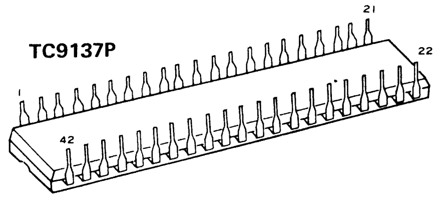

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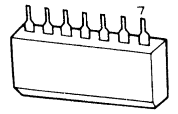

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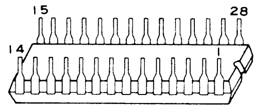

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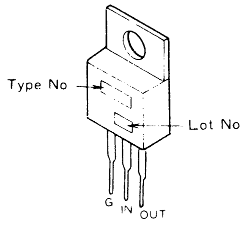
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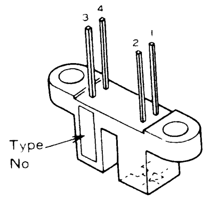
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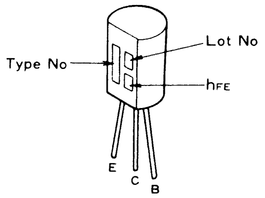
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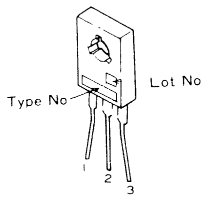
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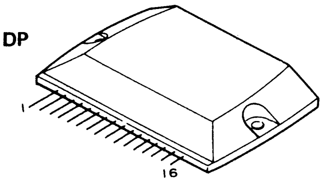
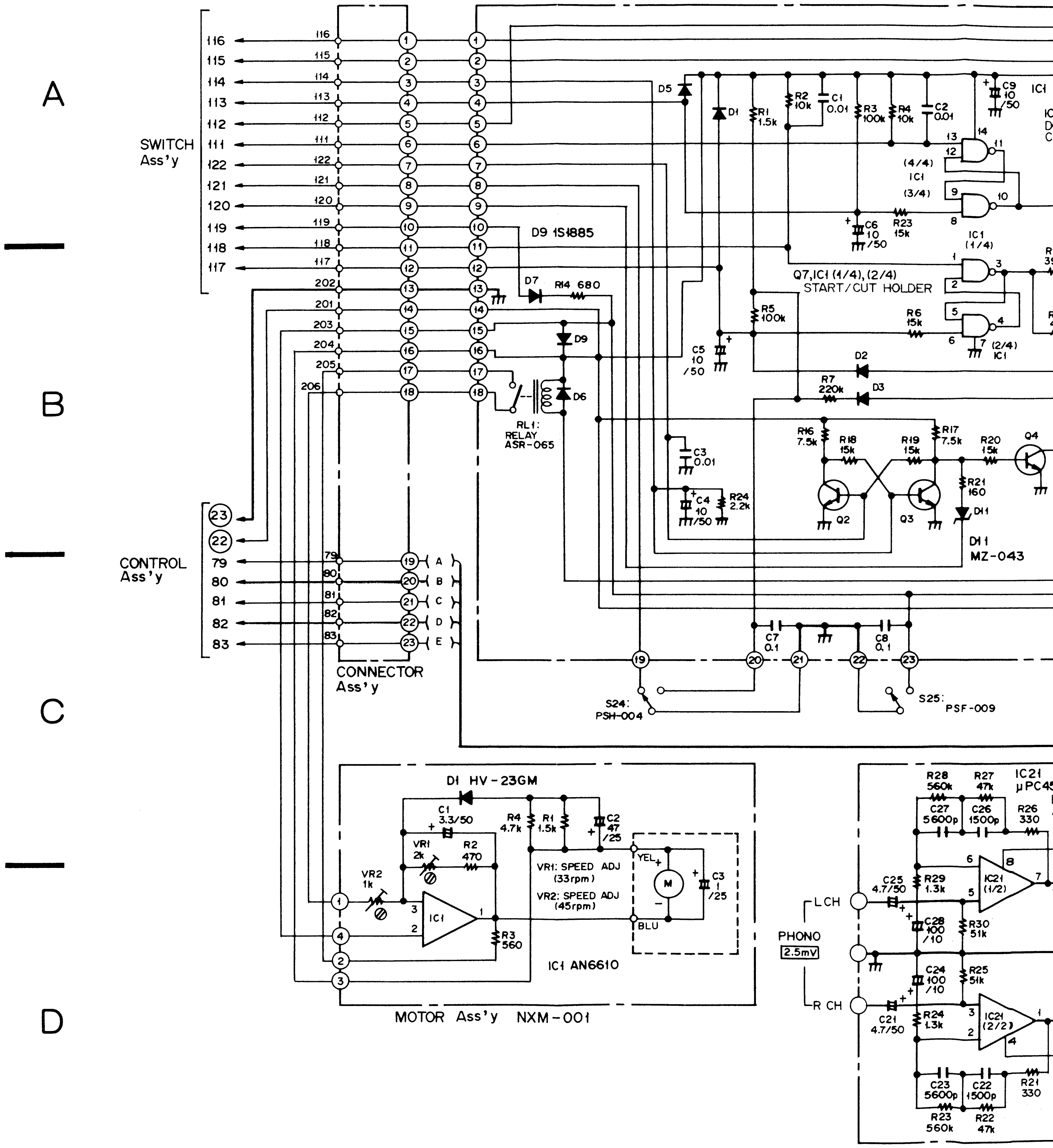
SI-1125-HDP



11. SCHEMATIC DIAGRAM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3
A
B
C
D
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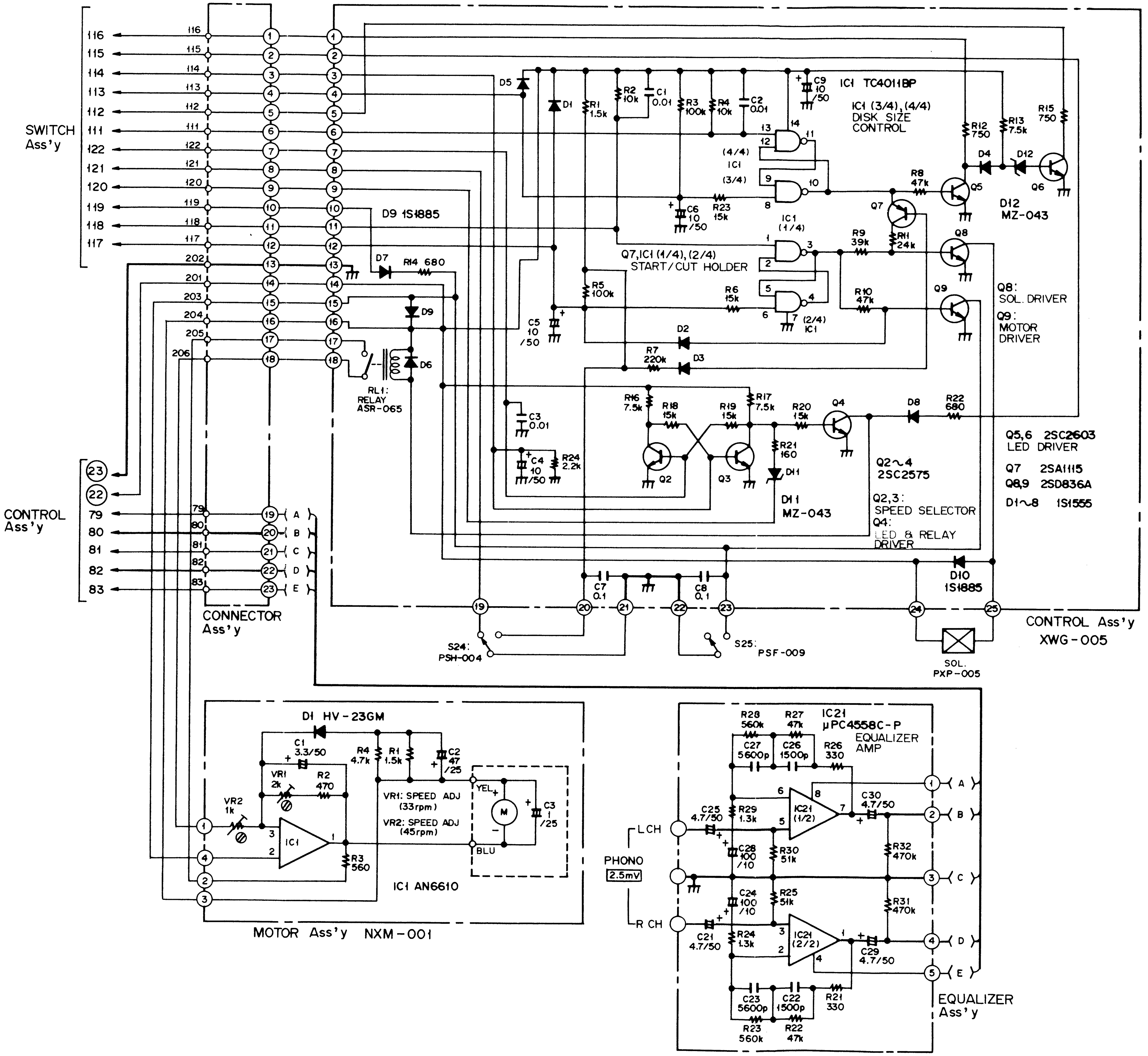
CONTROL Ass'y
CONNECTOR Ass'y
D9 1S1885
D7
R14 680
RL1: RELAY ASR-065
D5
D1
R1 1.5k
R2 10k
C1 0.01
R3 100k
R4 10k
C2 0.01
C9 10/50
IC1
(4/4) IC1
(3/4)
C6 10/50
R23 15k
IC1 (1/4)
Q7,IC1 (1/4), (2/4) START/CUT HOLDER
R5 100k
R6 15k
(2/4) IC1
C5 10/50
D2
R7 220k
D3
C3 0.01
C4 10/50
R24 2.2k
R16 7.5k
R18 15k
R19 15k
R17 7.5k
R20 15k
Q4
R21 160
Q2
Q3
D11
D11 MZ-043
C7 0.1
C8 0.1
S24: PSH-004
S25: PSF-009
D1 HV-23GM
C1 3.3/50
R4 4.7k
R1 1.5k
C2 47/25
VR1 2k
R2 470
VR2 1k
IC1
R3 560
VR1: SPEED ADJ (33rpm)
VR2: SPEED ADJ (45rpm)
YEL
BLU
M
C3 1/25
IC1 AN6610
MOTOR Ass'y NXM-001
R28 560k
R27 47k
IC21 µPC45
C27 5600p
C26 1500p
R26 330
C25 4.7/50
R29 1.3k
IC21 (1/2)
C28 100/10
R30 51k
L CH
PHONO
2.5mV
R CH
C24 100/10
R25 51k
C21 4.7/50
R24 1.3k
IC21 (2/2)
C23 5600p
C22 1500p
R21 330
R23 560k
R22 47k

11. SCHEMATIC DIAGRAM


SWITCH Ass'y
CONTROL Ass'y
CONNECTOR Ass'y
CONTROL Ass'y XWG-005
MOTOR Ass'y NXM-001
EQUALIZER Ass'y
IC1 TC4011BP
IC1 (3/4), (4/4) DISK SIZE CONTROL
Q7, IC1 (1/4), (2/4) START/CUT HOLDER
D9 1S1885
RL1: RELAY ASR-065
Q8: SOL. DRIVER
Q9: MOTOR DRIVER
D12 MZ-043
Q5,6 2SC2603 LED DRIVER
Q7 2SA1115
Q8,9 2SD836A
D1~8 1S1555
Q2~4 2SC2575
Q2,3: SPEED SELECTOR
Q4: LED & RELAY DRIVER
D11 MZ-043
D10 1S1885
S24: PSH-004
S25: PSF-009
SOL. PXP-005
D1 HV-23GM
IC1 AN6610
VR1: SPEED ADJ (33rpm)
VR2: SPEED ADJ (45rpm)
YEL
BLU
IC21 μPC4558C-P EQUALIZER AMP
PHONO 2.5mV
L CH
R CH

1. RESISTORS:
Indicated in Ω, ¼W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ± 10 % (M) : ± 20% tolerance.

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT:
☐ : Signal voltage at 28 W + 28 W 8Ω output (1kHz)
☐ : DC voltage (V) at no input signal
Value in ( ) is DC voltage at rated power.
⇦ mA : DC current at no input signal
☐ mV : Signal voltage at FM 400Hz 75kHz DEV.

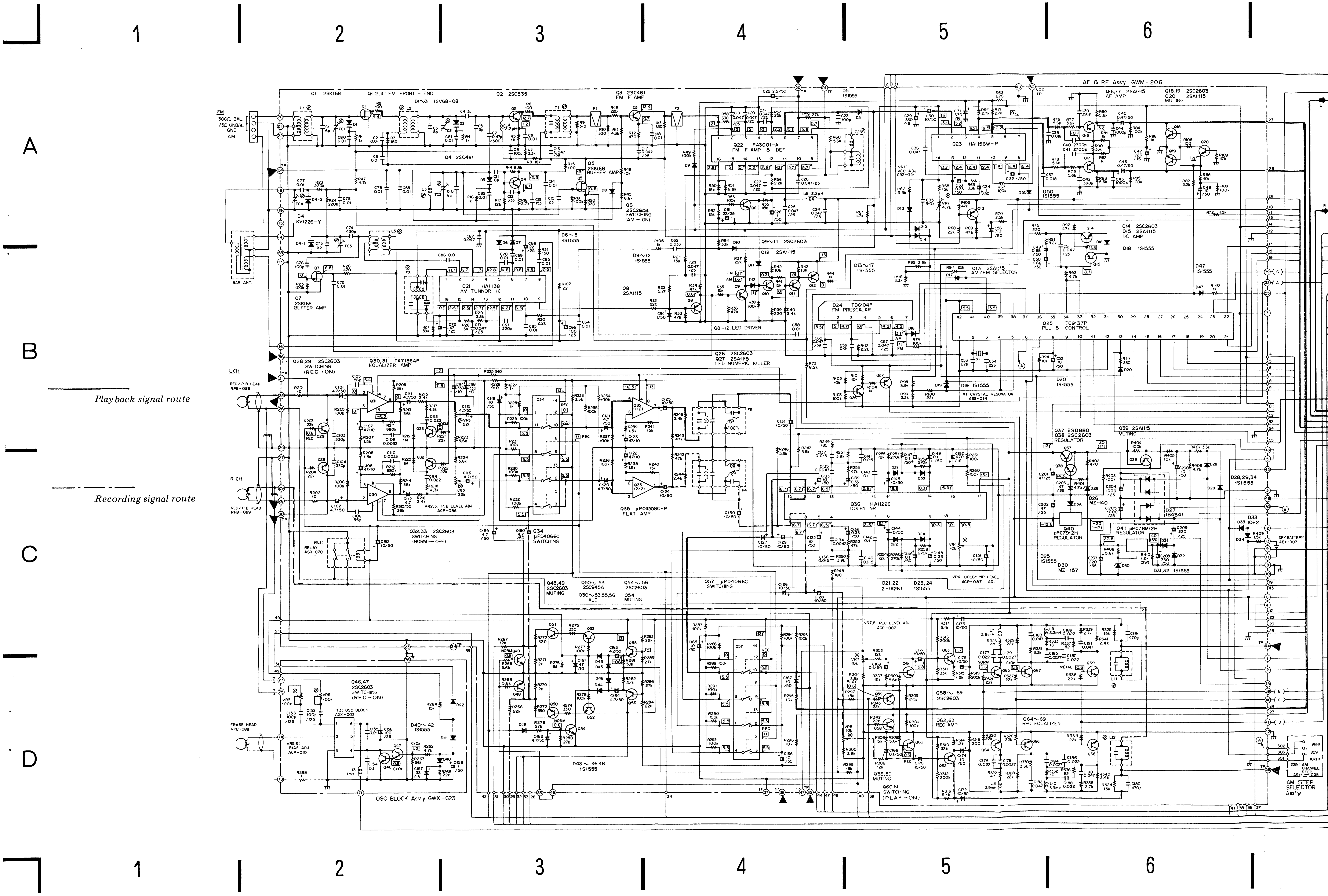
4. OTHERS:
➡ : Signal route.
⊘ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

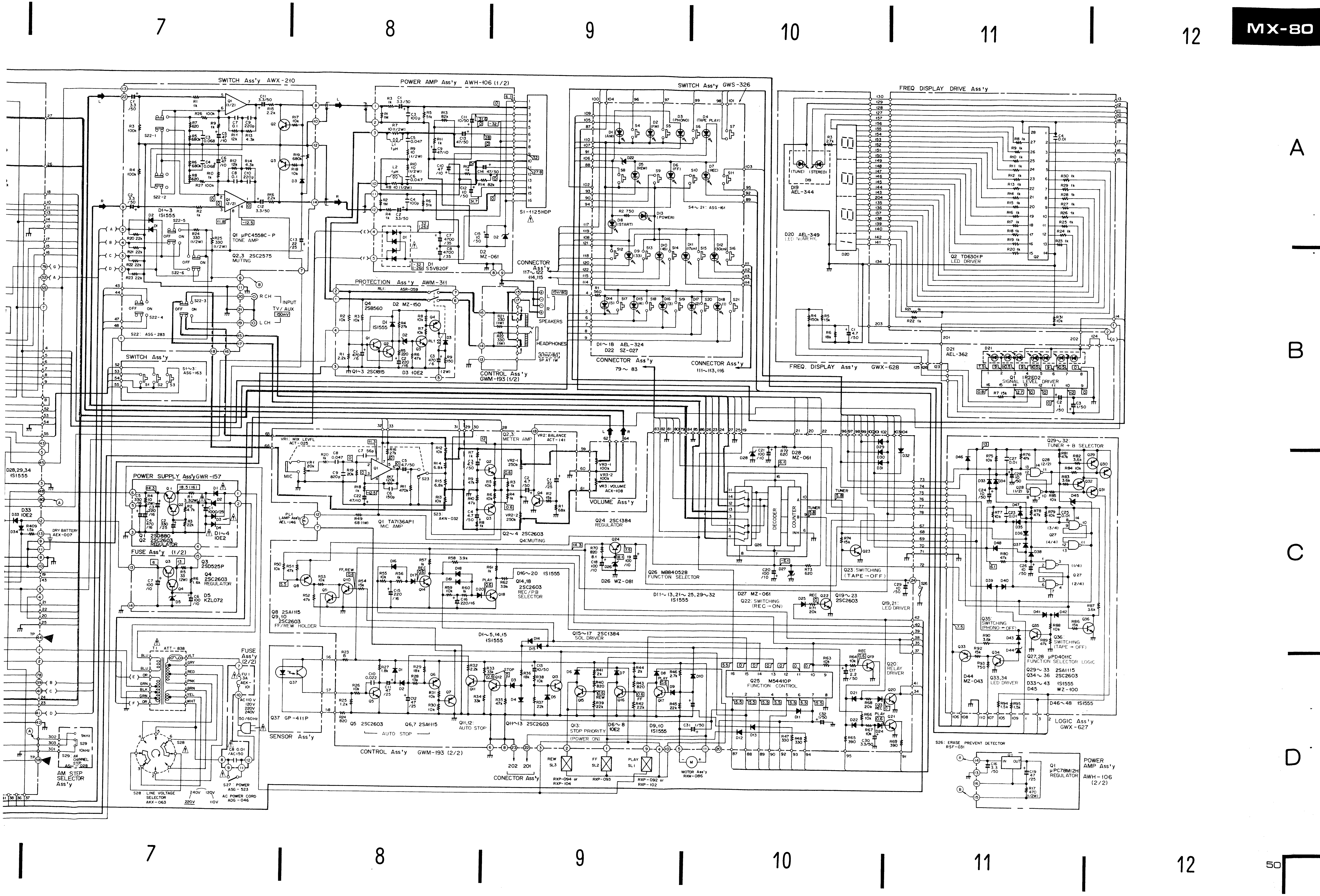
SWITCHES:

S1 :	TUNING (DOWN)	ON - OFF
S2 :	TUNING (UP)	ON - OFF
S3 :	MEMORY	ON - OFF
S4 :	AM	ON - OFF
S5 :	FM	ON - OFF
S6 :	PHONO	ON - OFF
S7 :	PLAY	ON - OFF
S8 :	STOP	ON - OFF
S9 :	REW	ON - OFF
S10 :	FF	ON - OFF
S11 :	REC	ON - OFF
S12 :	START / CUT	ON - OFF
S13 :	SPEED (33rpm)	ON - OFF
S14 :	SPEED (45rpm)	ON - OFF
S15 :	SIZE (17cm)	ON - OFF
S16 :	SIZE (30cm)	ON - OFF
S17 :	STATION (5)	ON - OFF
S18 :	STATION (4)	ON - OFF
S19 :	STATION (3)	ON - OFF
S20 :	STATION (2)	ON - OFF
S21 :	STATION (1)	ON - OFF
S22-1 :	TONE (LOW BOOST)	ON - OFF
S22-2 :	TONE (HIGH BOOST)	ON - OFF
S22-3 :	TV / AUX	ON - OFF
S22-4 :	DOLBY NR	ON - OFF
S22-5 :	TAPE SELECT (CrO2)	ON - OFF
S22-6 :	TAPE SELECT (METAL)	ON - OFF
S23 :	LINE MIC SELECTOR	LINE - MIC
S24 :	MECHANISM	ON - OFF
S25 :	ARM REST	OUT - IN
S26 :	ERASE PREVENT DETECTOR	HOLE - NO HOLE
S27 :	POWER	ON - OFF
S28 :	LINE VOLTAGE SELECTOR AC110V-120V-220V-240V	
S29 :	AM CHANNEL STEP	9kHz - 10kHz

The underlined indicates the switch position.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.


Playback signal route
Recording signal route
AF & RF Ass'y GWM-206
Q1 2SK168
Q1,2,4: FM FRONT - END
D1～3 1SV68-08
Q2 2SC535
Q3 2SC461 FM IF AMP
Q4 2SC461
Q5 2SK168 BUFFER AMP
Q6 2SC2603 SWITCHING (AM → ON)
D4 KV1226-Y
D6～8 1S1555
Q7 2SK168 BUFFER AMP
BAR ANT
FM 300Ω BAL 75Ω UNBAL GND AM
Q21 HA1138 AM TUNNOR IC
Q22 PA3001-A FM IF AMP & DET.
D5 1S1555
Q23 HA1156W-P
Q16,17 2SA1115 AF AMP
Q18,19 2SC2603 Q20 2SA1115 MUTING
VR1: VCO ADJ C92-051
D50 1S1555
Q14 2SC2603 Q15 2SA1115 DC AMP
D18 1S1555
D9～12 1S1555
Q8 2SA1115
Q9～11 2SC2603
Q12 2SA1115
Q8～12: LED DRIVER
D13～17 1S1555
Q13 2SA1115 AM/FM SELECTOR
D47 1S1555
Q24 TD6104P FM PRESCALAR
Q25 TC9137P PLL & CONTROL
Q26 2SC2603 Q27 2SA1115 LED NUMERIC KILLER
D19 1S1555
D20 1S1555
X1: CRYSTAL RESONATOR ASS-014
L CH
REC / P.B HEAD RPB-089
R CH
REC / P.B HEAD RPB-089
Q28,29 2SC2603 SWITCHING (REC → ON)
Q30,31 TA7136AP EQUALIZER AMP
VR2,3: P.B LEVEL ADJ ACP-086
Q32,33 2SC2603 SWITCHING (NORM → OFF)
Q34 μPD4066C SWITCHING
Q35 μPC4558C-P FLAT AMP
Q36 HA11226 DOLBY NR
D21,22 2-1K261 D23,24 1S1555
VR4: DOLBY NR LEVEL ADJ ACP-087
Q37 2SD880 Q38 2SC2603 REGULATOR
Q39 2SA1115 MUTING
D26 MZ-140
D27 1B4B41
D28,29,34 1S1555
D33 10E2
Q40 μPC7912H REGULATOR
Q41 μPC78M12H REGULATOR
D25 1S1555
D30 MZ-157
D31,32 1S1555
DRY BATTERY AEX-007
RL1: RELAY ASR-070
Q48,49 2SC2603 MUTING
Q50～53 2SC945A Q50～53,55,56 ALC
Q54～56 2SC2603 Q54 MUTING
Q57 μPD4066C SWITCHING
VR7,8: REC LEVEL ADJ ACP-087
Q58～69 2SC2603
Q62,63 REC AMP
Q64～69 REC EQUALIZER
Q58,59 MUTING
Q60,61 SWITCHING (PLAY → ON)
Q46,47 2SC2603 SWITCHING (REC → ON)
T3: OSC BLOCK AXX-003
D40～42 1S1555
D43～46,48 1S1555
VR5,6: BIAS ADJ ACP-010
ERASE HEAD RPB-088
OSC BLOCK Ass'y GWX-623
S29: AM CHANNEL STEP
9kHz 10kHz
AM STEP SELECTOR Ass'y
1 2 3 4 5 6
A B C D


7
8
9
10
11
12
A
B
C
D
SWITCH Ass'y AWX-210
Q1 µPC4558C-P TONE AMP
Q2,3 2SC2575 MUTING
D1~3 1S1555
S22-1
S22-2
S22-3
S22-4
S22-5
S22-6
S22: ASG-283
SWITCH Ass'y
S1~3: ASG-163
R CH
L CH
INPUT TV/AUX
150mV
POWER AMP Ass'y AWH-106 (1/2)
S1-1125HDP
D1 S5VB20F
D2 MZ-061
PROTECTION Ass'y AWM-311
RL1: ASR-059
Q4 2SB560
D2 MZ-150
D1 1S1555
Q1~3 2SC1815
D3 10E2
SPEAKERS
HEADPHONES
CONTROL Ass'y GWM-193 (1/2)
CONNECTOR Ass'y 117~122 114,115
SWITCH Ass'y GWS-326
D1 (AM)
D2 (FM)
D3 (PHONO)
D4 (TAPE PLAY)
D5 (REW)
D6 (FF)
D7 (REC)
D8 (START)
D13 (POWER)
S4~21: ASG-161
D1~18 AEL-324
D22 SZ-027
CONNECTOR Ass'y 79~83
CONNECTOR Ass'y 111~113,116
FREQ DISPLAY DRIVE Ass'y
D19 AEL-344
(TUNE) (STEREO)
D20 AEL-349 LED NUMERIC
Q2 TD6301P LED DRIVER
D21 AEL-362
Q1 IR2E02 SIGNAL LEVEL DRIVER
FREQ. DISPLAY Ass'y GWX-628
POWER SUPPLY Ass'y GWR-157
Q1 2SD880
Q2 2SC2603 REGULATOR
D1~4 10E2
FUSE Ass'y (1/2)
Q3 2SD525P
Q4 2SC2603 REGULATOR
D5 KZL072
D28,29,34 1S1555
D33 10E2
DRY BATTERY AEX-007
VR1: MIX LEVEL ACT-025
MIC
Q1 TA7136AP1 MIC AMP
PL1 LAMP Ass'y AEL-146
S23: AKN-032
Q2,3: METER AMP
VR2: BALANCE ACT-141
VR3: VOLUME ACX-108
VOLUME Ass'y
Q2~4 2SC2603
Q4: MUTING
Q24 2SC1384 REGULATOR
D26 WZ-081
Q26 M8840528 FUNCTION SELECTOR
DECODER
COUNTER
D28 MZ-061
D27 MZ-061
TUNER
Q23: SWITCHING (TAPE→OFF)
D11~13,21~25,29~32 1S1555
Q22: SWITCHING (REC→ON)
Q19~23 2SC2603
Q19,21: LED DRIVER
Q8 2SA1115
Q9,10 2SC2603
FF/REW HOLDER
D16~20 1S1555
Q14,18 2SC2603 REC/PB SELECTOR
D1~5,14,15 1S1555
Q15~17 2SC1384 SOL DRIVER
Q25 M54410P FUNCTION CONTROL
Q20: RELAY DRIVER
Q37 GP-411P
SENSOR Ass'y
Q5 2SC2603
Q6,7 2SA1115
AUTO STOP
Q11,12: AUTO STOP
Q11~13 2SC2603
Q13: STOP PRIORITY (POWER ON)
D6~8 10E2
D9,10 1S1555
CONTROL Ass'y GWM-193 (2/2)
CONECTOR Ass'y
REW SL3
FF SL2
PLAY SL1
RXP-094 or RXP-104
RXP-093
RXP-092 or RXP-102
MOTOR Ass'y RXM-086
Q29~32: TUNER + B SELECTOR
Q35: SWITCHING (PHONO→OFF)
Q36: SWITCHING (TAPE→OFF)
Q27,28 µPD4011C FUNCTION SELECTOR LOGIC
Q29~33 2SA1115
Q34~36 2SC2603
D33~43 1S1555
D45 WZ-100
D46~48 1S1555
D44 MZ-043
Q33,34 LED DRIVER
LOGIC Ass'y GWX-627
S26: ERASE PREVENT DETECTOR RSF-031
Q1 µPC78M12H REGULATOR
POWER AMP Ass'y AWH-106 (2/2)
ATT-838
FUSE Ass'y (2/2)
FU1 3A AEK-101
AC110V 120V 220V 240V
50/60Hz
S28 LINE VOLTAGE SELECTOR AKX-063
S27 POWER ASG-523
AC POWER CORD ADG-046
240V 120V 220V 110V
S29: AM CHANNEL STEP ASG-028
9kHz
10kHz
AM STEP SELECTOR Ass'y

12. PARTS LIST

NOTES:

- *Parts without part number cannot be supplied.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω 56 x 10^1 561 . . . . RD¼PS $\boxed{5}\boxed{6}\boxed{1}$ J
47kΩ 47 x 10^3 473 . . . . RD¼PS $\boxed{4}\boxed{7}\boxed{3}$ J
0.5Ω 0R5 . . . . RN2H $\boxed{0}\boxed{R}\boxed{5}$ K
1Ω 010 . . . . RS1P $\boxed{0}\boxed{1}\boxed{0}$ K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ 562 x 100 5621. . . . . RN¼SR $\boxed{5}\boxed{6}\boxed{2}\boxed{1}$ F

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number , temperature, humidity, etc.

Miscellaneous Parts

P.C. BOARD ASSEMBLIES

Mark	Part No.	Symbol & Description
	AWH-106	Power amplifier assembly
	GWM-206	AF, RF assembly
	GWX-623	OSC block assembly
	GWM-193	Control assembly
	GWX-627	Logic assembly
	GWS-326	Switch assembly
	GWX-628	Frequency display assembly
	AWM-311	Protection assembly
	GWR-157	Power supply assembly
	GWX-695	Fuse assembly
	AWX-210	Switch assembly
	NXM-001	Motor assembly
		Switch assembly
		AM step selector assembly
		Volume assembly
		Sensor assembly
		Frequency-display drive assembly
		EQ amplifier assembly

OTHERS

Mark	Part No.	Symbol & Description
⚠ ★★	ASG-523	S1 Push switch (POWER)
⚠ ★★	AKX-063	S2 Line voltage selector (switchable 4 positions)
⚠	ATT-838	T1 Power transformer (110V, 120V, 220V, 240V)
	ATB-631	T2 Bar antenna
⚠ ★★	AEK-101	FU1 Fuse (3A)
★★	SI-1125HDP	Power pack IC
★★	AEL-151	Lamp assembly
⚠	ADG-046	AC cord
	AEX-007	Nickel-cadmium battery

AF, RF Assembly (GWM-206)

COILS AND TRANSFORMERS

Mark	Part No.	Symbol & Description
	ATC-112	L1 FM antenna coil
	ATC-113	L2 FM RF coil
	ATC-115	L3 FM OSC coil
	ATF-113	L11, L12 Trap coil
	ATB-073	L5 AM OSC coil
	ATH-038	L9, L10 Inductor (3.3mH)
	ATH-047	L7, L8 Inductor (3.9mH)
	ATF-112	F4, F5 Dolby filter
	ATE-052	T2 FM detector transformer
	ATE-053	T1 FM matching transformer
	ATF-111	F1, F2 FM ceramic filter
	ATF-110	F3 AM ceramic filter
	ATH-039	L4, L6 RF choke coil

CAPACITORS

Mark	Part No.	Symbol & Description
	CCDRH 060D 50	C1
	CCDCH 020C 50	C15
	CCDCH 030C 50	C4
	CCDCH 050C 50	C5
	CCDCH 060D 50	C10, C73
	CCDTH 080D 50	C11
	CCDRH 080D 50	C3
	CCDRH 150J 50	C13
	CCDRH 330J 50	C12
	CCDSL 101J 50	C8, C23, C76
	CCDSL 560J 50	C105, C106
	CCDSL 221J 50	C67
	CKDYB 471K 50	C180, C181
	CKDYB 272K 50	C40, C41
	CKDYF 103Z 50	C2, C6, C9, C14, C18, C55, C58, C59, C64, C65, C69, C70, C75, C77, C78, C85, C86
	CKDYX 473M 25	C16, C17, C19–C21, C24–C27, C51, C57, C60, C63, C71, C87
	CKDYF 103Z 50	C79–C82
	CKDYB 102K 50	C43, C44
	CCDSL 220J 50	C53, C54
	CKDYB 391K 50	C39, C42
	CQSA 331J 50	C103, C104
	CQSA 431J 50	C74
	CQSA 511J 50	C35
	CQMA 332J 50	C109, C110
	CQMA 333K 50	C62
	CQMA 183J 50	C37, C38
	CQMA 473K 50	C36
	CQMA 223K 50	C113, C114, C176, C177, C186–C189
	CQMA 472J 50	C134, C135
	CQMA 272J 50	C178, C179, C184, C185
	CQMA 153J 50	C136, C137, C140, C141
	CQMA 104J 50	C142, C143
	CQMA 473J 50	C182, C183, C190, C191
	CGB R47K 500	C7
	CEA 0R1M 50L	C168, C169
	CEA R33M 50L	C33
	CEA R47M 50L	C45, C46
	CEA R68M 50L	C49, C50
	CEA 010M 50L	C28, C32, C34, C84
	CEA 2R2M 50L	C22, C56
	CEA 100M 50L	C30, C48, C52, C119, C124–C133, C144, C145, C151, C165–C167, C170–C175, C192, C206
	CEA 220M 25L	C61, C68
	CEA 470M 25L	C72, C201–C203
	CEA 471M 16L	C150
	CEA 470M 10L	C107, C108, C122, C123, C161
	CEA 4R7M 50L	C111, C112, C115, C116, C120, C121, C159, C160, C162–C164
	CEA 221M 16L	C47
	CEA 221M 25L	C209
	CEA 221M 35L	C207
	CEA 331M 10L	C117, C118
	CEA 331M 16L	C29, C31
	CEA 331M 50L	C208
	CEA 101M 25L	C66
	CEA 102M 25L	C204, C205
	CEANL 4R7M 50	C101, C102
	CEANL 0R1M 50	C146, C147
	CEANL R33M 50	C138, C139, C148, C149

Mark	Part No.	Symbol & Description
	ACM-014	TC1, TC2 Ceramic trimmer
	ACM-015	TC4, TC5 Ceramic trimmer
	ACM-006	TC3 Ceramic trimmer

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	C92-051	VR1 Semi-fixed (4.7k)
★	ACP-086	VR2, VR3 Semi-fixed (22k)
★	ACP-087	VR4, VR7, VR8 Semi-fixed (10k)
	RD1/8PM □□□ J	R1–R53, R54–R84, R87, R89–R106, R108–R112, R201–R203, R205–R209, R211–231, R235–R248, R250–R261, R266–R294, R296, R297, R299–R325, R328–R343, R401, R403, R404–R409
	RD¼VM □□□ J	R85, R86, R88, R106, R204, R210, R249, R295, R326, R327, R402
⚠	RD¼PMF □□□ J	R107
	RS2P □□□ J	R410

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SK168	Q1, Q5, Q7
★★	TC9137P	Q25
★★	HA1138	Q21
★★	PA3001-A	Q22
★★	HA1156W-P	Q23
★★	μPD4066C	Q34, Q57
★★	TA7136AP1	Q30, Q31
★★	μPC4558C-P	Q35
★★	TD6104P	Q24
★★	μPC78M12H	Q41
★★	2SD880	Q37
★★	2SC535	Q2
★★	2SC461	Q3, Q4
★★	2SC2603/A/ (2SC1815) (2SC945A)	Q6, Q9–Q11, Q14, Q18, Q19, Q26, Q28, Q29, Q32, Q33, Q38, Q48, Q49, Q54–Q56, Q58, Q59, Q60–Q69
★★	2SA1115/A/ (2SA1015) (2SA733A)	Q8, Q12, Q13, Q15–Q17, Q20, Q27, Q39
★★	2SC945A-P	Q50–Q53
★★	HA11226	Q36
★★	μPC79M12H	Q40
⚠ ★	10E2	D33
⚠	(SiB01-02)	
⚠ ★	1B4B41	D27
★	1S1555 (1S2076)	D6–D20, D23–D25, D28, D29, D31, D32, D34, D43–D48, D51
★	1S1555 (1S2473)	D50
★	MZ-140	D26

Mark	Part No.	Symbol & Description
★	1SV68-08	D1–D3
★	KV1226-Y	D4
★	2-1K261	D21, D22
★	MZ-157	D30

OTHERS

Mark	Part No.	Symbol & Description
	ASS-014	X1 Crystal
	ASR-014	Lead relay
	PBZ30P060FMC	Screw

OSC Block Assembly (GWX-623)

CAPACITORS

Mark	Part No.	Symbol & Description
	CQSF 101K 125	C152, C153
	CEA 010M 50L	C158
	CEA 330M 16L	C157
	CQMA 103K 50	C155
	CQMA 104K 50	C154
	CEA 101M 25L	C156

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	ACP-010	VR5, VR6 Semi-fixed (100k)
	RD1/8PM □□□ J	R262–R265, R298

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SC2603/A/ (2SC1815) (2SC945A)	Q46, Q47
★	1S1555 (1S2076)	D40–D42

OTHERS

Mark	Part No.	Symbol & Description
	AXX-003	T3 OSC block
	ATH-036	L13 Inductor (1mH)

Switch Assembly

Mark	Part No.	Symbol & Description
★★	ASG-163	S1–S3 Tact switch

AM Step-Selector Assembly

Mark	Part No.	Symbol & Description
★★	ASH-028	S4 Slide switch

Control Assembly (GWM-193)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 220M 25L	C1
	CCDSL 151J 50	C6
	CEA 100M 50L	C13, C29
	CEA 101M 10L	C18–C21
	CEA 101M 25L	C14
	CEA 221M 16L	C15, C16
	CEA 2R2M 50L	C17
	CEA 4R7M 50L	C2–C5
	CEA 470M 10L	C22
	CEA 470M 25L	C11, C12
	CQMA 473K 50	C8
	CQMA 223K 50	C10
	CKDYB 821K 50	C9
	CCDSL 560J 50	C7
	CEA 3R3M 50L	C30
	CEA 010M 50L	C31, C32

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	ACT-025	VR1 Volume (MIX LEVEL)
★	AVT-141	VR2 Volume (BALANCE)
	RD1/8PM □□□ J	R1, R3–R6, R9–R17, R19, R20, R23, R25–R35, R37–R39, R42–R44, R46–R48, R50–R74
	RD¼VM □□□ J	R2, R7, R8, R18, R24, R36, R40, R41, R45
	RS1P □□□ J	R21, R22, R49

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	TA7136AP1	Q1
★★	M54410P	Q25
★★	MB84052B	Q26
★★	2SA1100 (2SA733A)	Q6–Q8
★★	2SC2575 (2SC945A)	Q2–Q5, Q9–Q14, Q18–Q23
★★	2SC1384	Q15–Q17, Q24
★	1S1555 (1S2076) (1S2473)	D1–D5, D9–D25, D29–D32
★	MZ-061 (WZ-061)	D27, D28
★	WZ-081 (MZ-081)	D26

OTHERS

Mark	Part No.	Symbol & Description
	AKN-031	Headphones jack
	AKN-032	MIC jack

Power Supply Assembly (GWR-157)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 102M 25L	C1
	CEA 221M 16L	C3
	CEA 331M 16L	C5
	CEA 331M 25L	C2
	CEA 471M 16L	C4

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RN2P 3R3K	R1
	RD¼VM 472J	R2
	RD¼VM 223J	R3
	RS2P 100J	R4

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SD880 (2SC2603) (2SC1815) (2SC945A)	Q1
⚠ ★	10E2	D1–D4

OTHERS

Mark	Part No.	Symbol & Description
	PBZ30P060FMC	Screw

Frequency-Display Drive Assembly

CAPACITOR

Mark	Part No.	Symbol & Description
	CKDYF 103Z 50	C4

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD1/8PM □□□ J	R8–R30

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	TD6301	Q2

Switch Assembly (GWS-326)

SWITCHES

Mark	Part No.	Symbol & Description
★★	ASG-161	S1–S18 Tact switch

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD1/8PM □□□ J	R3–R7

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	IR2E02	Q1
★	AEL-344	D19 LED array
★	AEL-362	D21 LED array
★	AEL-349	D20 LED indicator

Switch Assembly (AWX-210)

SWITCH

Mark	Part No.	Symbol & Description
★★	ASG-283	

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 3R3M 50L	C1, C2, C11, C12
	CEA 220M 25L	C13
	CEA 470M 10L	C5, C6
	CQMA 104J 50	C7, C8
	CQMA 683J 50	C3, C4
	CCDSL 221J 50	C9, C10

RESISTORS

Note: When ordering resistors, covert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD¼VM □□□ J	R1, R5, R14, R27
	RD1/8PM □□□ J	R2–R4, R6–R13, R15–R23, R26
	RD½PS □□□ J	R24, R25

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	μPC4558C	Q1
★★	2SC2575 (2SC945A)	Q2, Q3
★	1S1555 (1S2473) (1S2076)	D1–D3

Fuse Assembly (GWX-695)

CAPACITORS

Mark	Part No.	Symbol & Description	
	CEA 101M 10L	C6, C7	
⚠	ACG-019	C8	Spark killer

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD¼VM 162J	R6
	RS2P 330J	R5

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SD525P	Q3
★★	2SC2603/A/ (2SC1815) (2SC945A)	Q4
★	KZL072	D5

Power Amplifier Assembly (AWH-106)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 3R3M 50L	C1, C2, C16
	ACH-237	C7, C8
	CEA 100M 50L	C11, C12, C15
	CEA 470M 10L	C9, C10
	CEA 470M 50L	C13, C14
	CCDSL 101J 50	C3, C4
	CQMA 473J 50	C5, C6
	CEA 470M 25L	C17

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD¼PM □□□ J	R1–R6, R11–R14
	RD½PS 100J	R7, R8, R17
	RD½PSF 100J	R9, R10

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	μPC78M12H	Q1
★	S5VB20F	D1
★	MZ-061	D2

Volume Assembly

Mark	Part No.	Symbol & Description	
★	ACX-108	VR3	Slide volume

Protection Assembly (AWM-311)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 471M 6L	C1, C3
	CEA 221M 16L	C2

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD¼PM □□□ J	R1–R9

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SC1815 (2SC945A)	Q1–Q3
★★	2SB560	Q4
★	1S1555 (1S2473)	D1
★	WZ-150 (MZ-150)	D2
★	10E2	D3

OTHERS

Mark	Part No.	Symbol & Description	
★★	ASR-059	RL1	Relay
	PMZ30P080FZK		Screw

Logic Assembly (GWX-627)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 100M 50L	C24, C26, C28
	CKDYF 103Z 50	C23, C25, C27

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD1/8PM □□□ J	R76–R85, R87–R90, R93
	RD¼VM □□□ J	R75, R86, R92, R94, R95

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	μPD4011C	Q27, Q28
★★	2SA1100 (2SA733A)	Q29–Q33
★★	2SC2575 (2SC945A)	Q34–Q36
★	1S1555 (1S2473)	D33–D43, D46–D48
★	WZ-100 (MZ-100)	D45
★	MZ-043 (SZ-027)	D44

EQ Amplifier Assembly

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 4R7M 50L	C21, C25, C29, C30
	CQMA 152J 50	C22, C26
	CQMA 562J 50	C23, C27
	CEA 101M 10L	C24, C28

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before

Mark	Part No.	Symbol & Description
	RD¼PM □□□ J	R21–R32

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	μPC4558C-P (NJM4558DX)	IC21

Function Circuit Assembly

CAPACITORS

Mark	Part No.	Symbol & Description
	CKDYF 103Z 50	C1–C3
	CEA 100M 50L	C4–C6, C9
	CKDYX 104M 25	C7, C8

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD¼PM □□□ J	R1–R23

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	TC4011BP	Q1
★★	2SC2575 (2SC945) (2SC1815)	Q2–Q6
★★	2SA1100 (2SA733)	Q7
★★	2SD836A	Q8, Q9
★	1S1555 (1S2473)	D1–D8
★	1S1885	D9, D10
★	MZ-043 (WZ-043)	D11, D12

Sensor Assembly

Mark	Part No.	Symbol & Description
★★	GP-411P	Q37

Motor Assembly (NXM-001)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 3R3M 25L	C1
	CEA 470M 25L	C2

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description	
★	EVN-31AA00B23	VR1	Semi-fixed 2k
★	EVN-31AA00B13	VR2	Semi-fixed 1k
	RD¼PM □□□ J	R1–R4	

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	AN6610	IC1
★	HV-23GMC	D1

Frequency Display Assembly (GWX-628)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 4R7M 50L	C1
	CEA 010M 50L	C2, C3

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD1/8 PM □□□ J	R3–R7

SEMICONDUCTORS

Mark	Part No.	Symbol & Description	
★★	IR2E02	Q1	
★	AEL-344	D19	LED array
★	AEL-362	D21	LED array
★	AEL-349	D20	LED indicator

13. ADJUSTMENTS

13.1 TUNER SECTION ADJUSTMENTS

- The received frequency is changed one step at a time (0.1MHz steps in FM band and 9kHz steps in AM band) each time the TUNING UP or DOWN button is pressed. The frequency is changed rapidly if either button is pressed continuously.

FM Stage

- Connect up as shown in Fig. 13-1.
- Set the function selector to the TUNER FM position.
- Set the TC1, TC2 and TC3 trimmers to about the central capacitance values.

*1 When adjusting at 2 different frequencies alternately during a particular adjustment procedure, those frequencies may be preset in memory (MX-80) in order to simplify the operation.

*2 Main 1kHz · L + R · ±67.5kHz deviation, pilot 19kHz · ±7.5kHz deviation.

*3 Output signals from pins 16 (left channel) and 18 (right channel) of the switch assembly (AWX-210).

Step	FM SG (400Hz,±75kHz deviation)		MX-80 Frequency display	Adjustment point	Adjustment procedure
	Frequency	Level			
1	No signal		87.5MHz	L3	Adjust so the DC voltage at terminal No. 54 is 6.5V.
2			108MHz	TC3	Adjust so the DC voltage at terminal No. 54 is 20V.
3	Repeat steps 1 and 2 until both requirements have been met.				
4	90MHz	15dB or so	90MHz	L1, L2	Adjust so the DC voltage at terminal No. 56 is maximum.
5	106MHz		106MHz	TC1, TC2	
6	Repeat steps 4 and 5 until maximum sensitivity is attained.				
7	98MHz	15dB or so	98MHz	T1	Adjust so the DC voltage at terminal No. 56 is maximum.
8		86dB		T2	Adjust so the DC voltage between terminals No. 51 and No. 52 is 0.1V.
9	98MHz No modulation	86dB		VR1	Adjust so the frequency at terminal No. 50 is 19kHz ±100Hz.
10	98MHz (*2) Set to stereo modulation	86dB		T1	(*3) Adjust so the distortion is minimum.
11	98MHz	40dB or so		Check that the muting circuit is not functioning at above 40dB. If not, remove R50.	

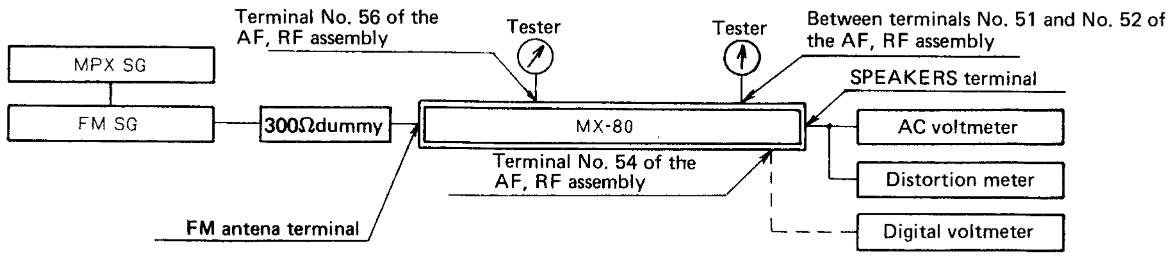

Terminal No. 56 of the AF, RF assembly
Tester
Tester
Between terminals No. 51 and No. 52 of the AF, RF assembly
MPX SG
SPEAKERS terminal
FM SG
300Ωdummy
MX-80
AC voltmeter
Terminal No. 54 of the AF, RF assembly
Distortion meter
FM antena terminal
Digital voltmeter

Fig. 13-1 Connection for FM tuner adjustment

AM Section

- Connect up as shown in Fig. 13.2.
- Set the function selector to the TUNER AM position.
- Set the TC4 and TC5 trimmers to about the central capacitance values.

Step	AM SG(400Hz,30% modulation)		MX-80 Frequency display	Adjustment point	Adjustment procedure
	Frequency	Level			
1	No signal		522kHz	L5	Adjust so the DC voltage at terminal No. 54 is 2V.
2			1602kHz	TC5	Adjust so the DC voltage at terminal No. 54 is 25V.
3	Repeat steps 1 and 2 until both requirements have been met.				
4	603kHz	40dB or so	603kHz	Bar-antenna	Adjust so the DC voltage at terminal No. 56 is maximum.
5	1395kHz		1395kHz	TC4	
6	Repeat steps 4 and 5 until maximum sensitivity is attained.				
7	999kHz	40dB or so	999kHz	F3	Adjust so the DC voltage at SPEAKERS terminal is maximum.

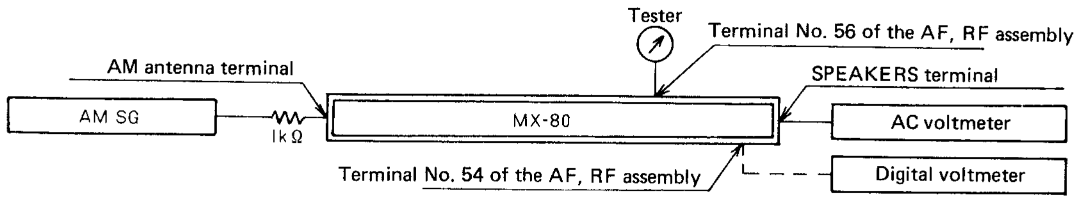
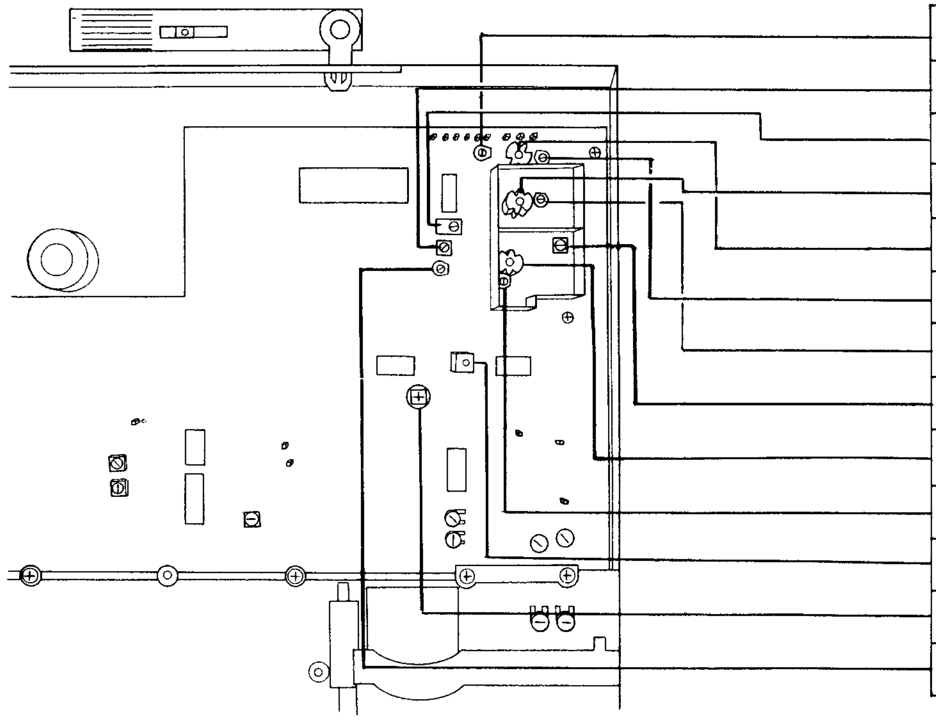

Tester
Terminal No. 56 of the AF, RF assembly
AM antenna terminal
SPEAKERS terminal
AM SG
1kΩ
MX-80
AC voltmeter
Terminal No. 54 of the AF, RF assembly
Digital voltmeter

Fig. 13-2 Connection for AM tuner adjustment



TC4	AM RF trimmer
L5	AM OSC coil
F3	AM ceramic filter
L2	FM RF coil
L1	FM RF coil
TC1	FM RF trimmer
TC2	FM RF trimmer
T1	FM IFT
L3	FM OSC coil
TC3	FM OSC trimmer
T2	FM DET coil
VR1	VCO ADJ.
TC5	AM OSC trimmer

Fig. 13-3 Adjustment and measuring points

13.2 TURNTABLE SECTION ADJUSTMENTS

13.2.1 Rotational Speed (RPM)

Notes:

- *The 33rpm speed is adjusted first. And since the tonearm moves across during the adjustment, the protective stylus cover must be attached.*
- *The adjustment is performed through the opening for turntable belt attachment.*

1. Set the POWER, PHONO and 33(SPEED) switches to ON.
2. Move the tonearm across to the turntable platter by hand in order to start the turntable, and check the rotational speed with the stroboscope plate.
3. Return the tonearm by hand to the arm rest to stop the turntable.
4. Adjust VR1.
5. Repeat steps 2, 3 and 4 until the correct speed is obtained.
6. For 45rpm adjustment, set the 45(SPEED) switch ON, and adjust VR2 (in the same way as described above for 33rpm).

13.2.2 Stylus Lowering Position

1. Place a 30cm LP record on the turntable platter.
2. Set the SIZE selector to 30cm, and press the START/CUT switch to commence play. Note the position where the stylus lowers onto the record during this step.
3. Press the START/CUT switch again to stop record play, and adjust the stylus lowering position adjustment screw.
4. Repeat steps 2 and 3 above to obtain an accurate lowering into the record lead-in groove. Then repeat with a 17cm record.

When Adjusting with Test Records

Stylus lowering position adjustment is performed with the tonearm initially in the arm rest.

30cm lowering position..... descend at count of 306 to 313.
17cm lowering position..... descend at count of 175 to 183.

13.2.3 Auto-Return Adjustment

1. Disengage the belt from the motor pulley, and remove the turntable platter.
2. Turn the auto-return adjustment screw full around clockwise.
3. Move the tonearm right across to the center of the turntable.
4. Turn the auto-return adjustment screw counter clockwise a little at a time. The tonearm will start to move towards the outer edge of the turntable.
5. Stop turning the screw when the stylus tip is 33mm away from the center spindle.
6. After completing the adjustment, check that auto-return functions correctly.

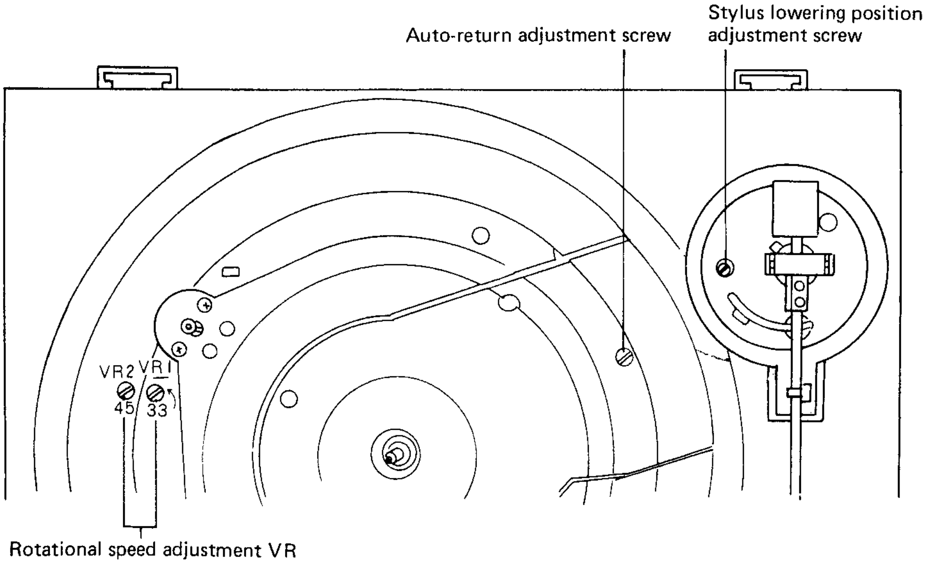

Auto-return adjustment screw
Stylus lowering position adjustment screw
VR2
VR1
45
33
Rotational speed adjustment VR

Fig. 13-4 Adjustment and measuring points

13.3 CASSETTE DECK MECHANICAL ADJUSTMENT

13.3.1 Pinch Roller Pressure Adjustment

1. Put the tape deck into the playback mode without cassette tape.
2. Gently push against the pinch roller arm with tension gauge (Part No. GGK-047) and separate the pinch roller slightly from the capstan.
3. Then the pinch roller back onto the capstan, and read the value when the pinch roller starts to rotate. If the reading fails to lie within 200 – 250g, replace the pinch pressure spring (Part No. RBH-742).

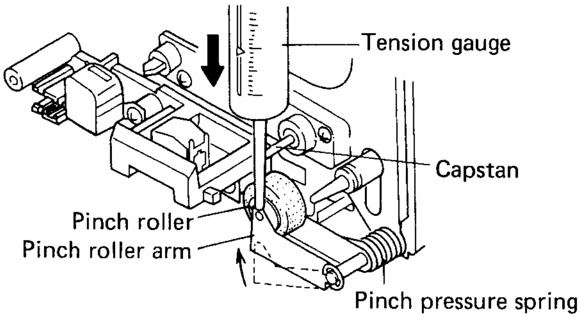


Fig. 13-5 Pinch roller pressure adjustment

13.3.2 Reel Base Torque Adjustment

Measure the torque with torque meter (Part No. GGK-056) during playback, fast forward (FF) and rewind (REW) modes. The measured values should normally lie within the allowable ranges listed in the table 1.

If the measured values lie outside the relevant ranges, replace the TU (take-up) reel base assembly and/or supply reel base assembly, TU idler, or drive arm assembly.

Table 1

	TU reel base	Supply reel base
Playback mode	35 – 55g.cm	* 2 – 5g.cm
FF mode	75 – 110g.cm	* 2 – 5g.cm
REW mode	* 2 – 5g.cm	75 – 110g.cm

** Do notes back tension torque*

13.3.3 Tape Speed Adjustment

1. Connect the frequency counter to the terminals No.35 (Lch) and/or No.36 (Rch) of the AF, RF assembly.
2. Play back the 3kHz portion of the STD-301 test tape. At the beginning the frequency should be lie within the 3000 – 3010Hz range, and may be adjusted by turning the semi-fixed resistor located in the capstan motor adjustment hole as shown in Fig. 13-6.

Tape speed is increased by turning the semi-fixed resistor clockwise, and decrease by turning counter-clockwise.

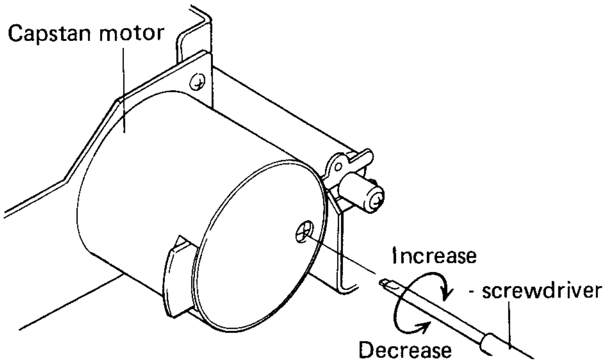


Fig. 13-6 Tape speed adjustment

13.3.4 FF Solenoid Adjustment

1. Put the deck into FF mode.
2. Loosen screws ❶ and adjust the FF solenoid mounting position so that the square hole of the reel base full assembly is flush against the boss of the driving arm full assembly (i.e. 0 separation) as shown in Fig. 13-7.

13.3.5 REW Solenoid Adjustment

1. Put the deck into REW mode.
2. Loosen screw ❷ and adjust the REW solenoid mounting position so that the square hole of the reel base full assembly is flush against the boss of the driving arm full assembly (i.e. 0 separation) as shown in Fig. 13-7.

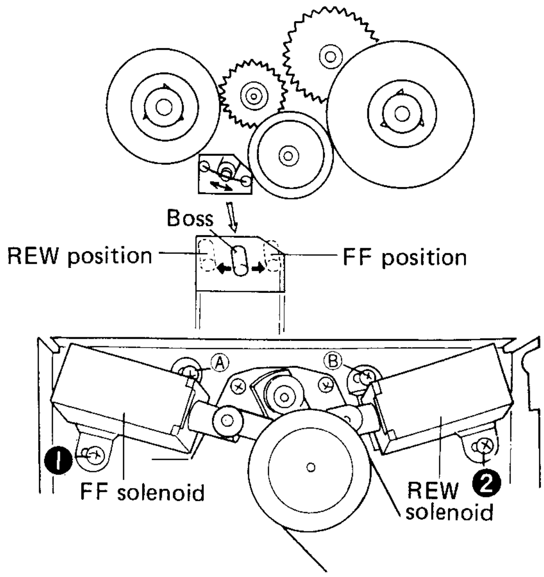


Fig. 13-7 FF (REW) solenoid adjustment

13.4 CASSETTE DECK ELECTRICAL ADJUSTMENTS

Precaution

1. Mechanical adjustment should be completed.
2. Clean the following parts with an alcohol moistened swab: Record/Playback head, Pinch roller, Erase head, Rubber belts and Capstan.
3. Demagnetize record/playback head with a head demagnetizer.
4. Do not use magnetized screwdriver for adjustments.
5. Adjustments and measurements should be performed for both L ch and R ch with rated power supply voltage.
6. Adjustments should be performed in the order given in this service manual. Altering the order can hinder proper adjustments, resulting in loss of performance.
7. Level during measurements are based on 0dBv = 1V. Connect a 50kΩ (47 — 52kΩ) dummy resistor across the OUTPUT terminals.
8. Let the MX-80 warm up (aging) for a few minutes before proceeding with the adjustment.
9. Set the DOLBY NR switch to OFF and TAPE SELECT to the Norm position unless directed otherwise.

Test Equipments/Tools Required:

1. Test tape

STD-341A........	For playback adjustment
STD-608A........	NORMAL blank tape
STD-603	CrO_2 blank tape
STD-604	METAL blank tape

2. Audio oscillator
3. AC millivoltmeter (AC mV)
4. Attenuator
5. Oscilloscope
6. Resistor 50kΩ (47 — 52kΩ)

13.4.1 Head Azimuth Adjustment

Setting

Mode..............	Playback
Test Tape	STD-341A (10kHz, -20dB)
AC mV meter	No.35 (Lch) and No.36 (Rch) of the AF, RF assembly

Procedure

Adjust the azimuth adjusting screw for maximum AC mV meter readings for both L and R channels. After this adjustment, lock the screw with screw lock.

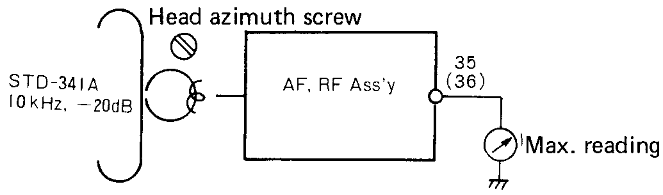


Fig. 13-8 Head azimuth adjustment

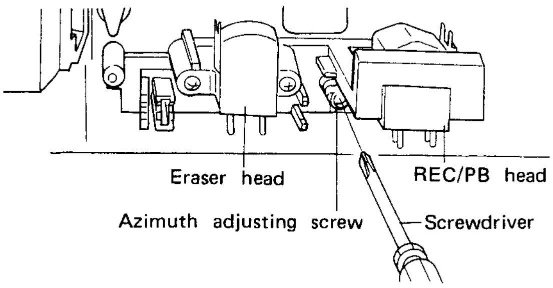


Fig. 13-9 Head azimuth adjustment

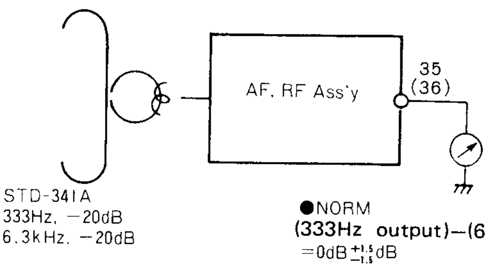
13.4.2 Playback Equalizer Adjustment

Setting

Mode..............	Playback
Test Tape	STD-341A (333Hz and 6.3kHz, -20dB)
AC mV meter	No.35 (Lch) and No.36 (Rch) of the AF, RF assembly

Procedure

1. Set the TAPE SELECT to the Norm position. Play back the 333Hz and 6.3kHz portion of the STD-341A, and check that the difference between the two output levels does not exceed 0dB±1.5dB.
2. Next set the TAPE SELECT to the Metal position. Play back the 333Hz and 6.3kHz portions again, and check that the difference between the two output levels does not exceed -3.5dB ±1.5dB.



●NORM
(333Hz output)—(6.3kHz output) $=0\text{dB}^{+1.5}_{-1.5}\text{dB}$

●METAL
(333Hz output)—(6.3kHz output) $=-3.5\text{dB}^{+1.5}_{-1.5}\text{dB}$

Fig. 13-10 Playback equalizer adjustment

13.4.3 Playback Level Adjustment

Since this adjustment determines the DOLBY NR level during playback, it should be performed precisely.

Setting

Mode..............	Playback
Test tape...........	STD-341A (333Hz, 0dB)
AC mV meter	No.35 (Lch) and No.36 (Rch) of the AF, RF assembly

Procedure

Adjust the VR3 (Lch) and VR2 (Rch) so that the AC mV meter reads −0.6dBv (0.93V).

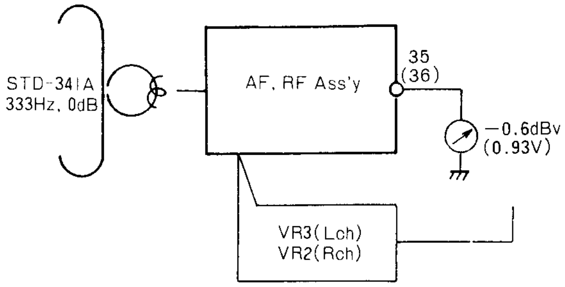


Fig. 13-11 Playback level adjustment

13.4.4 Bias Trap Adjustment

Setting

Mode..............	Record
TAPE SELECT......	Metal
Oscilloscope	No.44 (Lch) and No.38 (Rch) of the AF, RF assembly
Input Signal	None signal

Procedure

Adjust the L11 (Lch) and L12 (Rch) so that the bias leakage level becomes minimum.

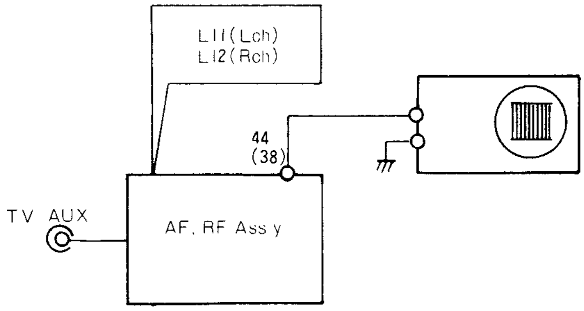


Fig. 13-12 Bias trap adjustment

13.4.5 Recording Current Adjustment

Since the level is extremely low, be perticularly careful to avoid external induction noise during this adjustment.

Setting

Mode..............	Record
AC mV meter	No.35 (Lch) and No.36 (Rch) of the AF, RF assembly
Input Signal	333Hz, approximately −8 dBv (400mV) to the TV/AUX terminals

Procedure

1. Adjust the attenuator so that the AC mV meter reads −2.2dBv (0.775V).
2. Connect the jumper cord between terminals No.72 and No.76 of the OSC block assembly. Then connect the AC mV meter between terminals No.25 and No.31 (Lch) and also between terminals No.28 and No.30 (Rch) of the AF, RF assembly.
3. Adjust the VR7 (Lch) and VR8 (Rch) so that the AC mV meter reads −66dBv (0.5mV).
4. Disconnect the jumper cord.

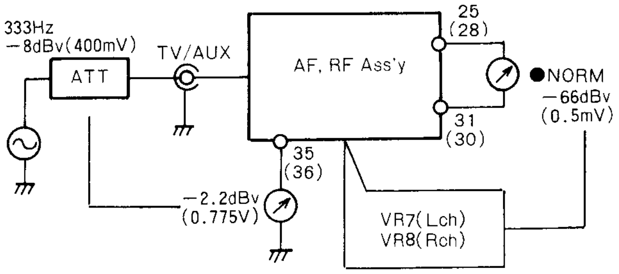


Fig. 13-13 Recording current adjustment

13.4.6 Recording Bias Adjustment

The fine adjustment of recording bias is made in section 13.4.7 Record/Playback Response Adjustment.

Setting

Mode..............	Record
AC mV meter	Between terminals No.25 and No.31 (Lch) and No.28 and No.30 (Rch) of the AF, RF assembly
Input Signal	None signal

Procedure

Adjust the VR5 (Lch) and VR6 (Rch) of the OSC block assembly so that the AC mV meter reads 3.3mV.

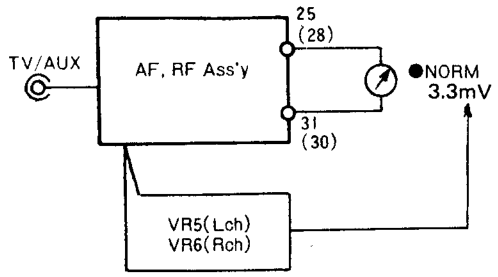

TV/AUX
AF, RF Ass'y
25
(28)
31
(30)
●NORM
3.3mV
VR5(Lch)
VR6(Rch)

Fig. 13-14 Recording bias adjustment

13.4.7 Record/Playback Response Adjustment

Setting

Mode	Record/Playback
Test Tape	STD-608A
AC mV meter	No.35(Lch) and No.36 (Rch) of the AF, RF assembly
Input Signal	333Hz, approximately −33 dBv (22.4mV) to the TV/AUX terminals
Function Switch	TV/AUX

Procedure

1. Adjust the input signal level with the attenuator so that the AC mV meter reads −27.2dBv (43mV).
2. Record the 1kHz and 10kHz signals onto the STD-608A.
3. Play back the tape and adjust the VR5 (Lch) and VR6 (Rch) so that the difference between two outputs is 0dB±1dB at 10kHz.

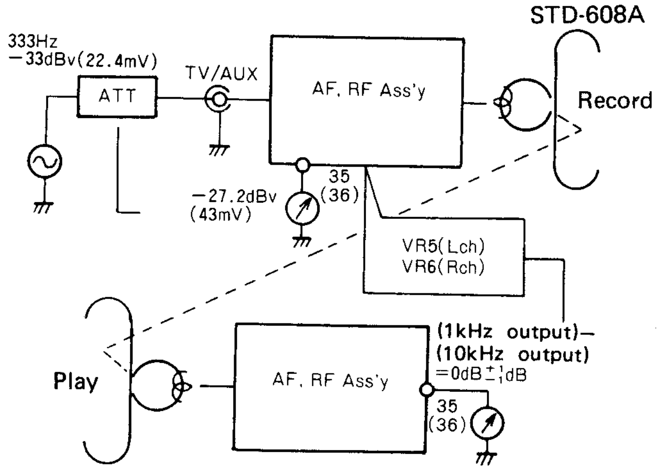

STD-608A
333Hz
−33dBv(22.4mV)
TV/AUX
ATT
AF, RF Ass'y
Record
35
(36)
−27.2dBv
(43mV)
VR5(Lch)
VR6(Rch)
Play
AF, RF Ass'y
(1kHz output)−
(10kHz output)
=0dB±1dB
35
(36)

Fig. 13-15 Record/Playback adjustment

13.4.8 Recording Level Adjustment

Since this adjustment determines the DOLBY NR level during recording, it should be performed precisely.

Setting

Mode	Record/Playback
Test Tape	STD-608A
AC mV meter	No.35 (Lch) and No.36 (Rch) of the AF, RF assembly
Input Signal	333Hz, approximately −18 dBv (125mV) to the TV/AUX terminals

Procedure

1. Adjust the input signal level with the attenuator so that the AC mV meter reads −12.2dBv (245mV).
2. Record the 333Hz signals onto the STD-608A. Play back the tape and adjust the VR7 (Lch) and VR8 (Rch) so that the AC mV meter reads −12.2dBv (245mV).

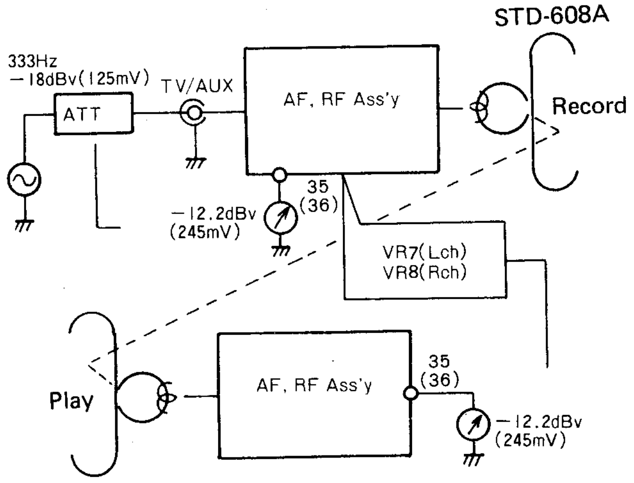

STD-608A
333Hz
−18dBv(125mV)
TV/AUX
ATT
AF, RF Ass'y
Record
35
(36)
−12.2dBv
(245mV)
VR7(Lch)
VR8(Rch)
Play
AF, RF Ass'y
35
(36)
−12.2dBv
(245mV)

Fig. 13-16 Recording level adjustment

13.4.9 DOLBY NR Adjustment

Setting

Mode	Record
AC mV meter	No.35 (Lch) and No.36 (Rch) of the AF, RF assembly
Input Signal	2kHz, −28dBv (40mV) to the TV/AUX terminals
Function Switch	TV/AUX
VR4	Center position

Procedure

1. Adjust the input signal level with the attenuator so that the AC mV meter reads −22.2dBv (77.5mV).
2. Next connect the AC mV meter between terminal No.47 of the AF, RF assembly and ground. Then set the DOLBY NR switch to ON.
3. Adjust the VR4 so that the AC mV meter reads −17.9dBv (127mV).

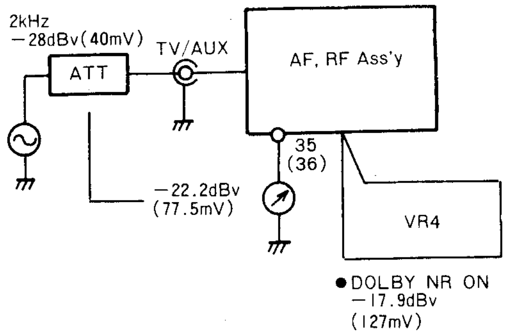

2kHz
−28dBv(40mV)
TV/AUX
ATT
AF, RF Ass'y
35
(36)
−22.2dBv
(77.5mV)
VR4
●DOLBY NR ON
−17.9dBv
(127mV)

Fig. 13-17 Dolby NR adjustment

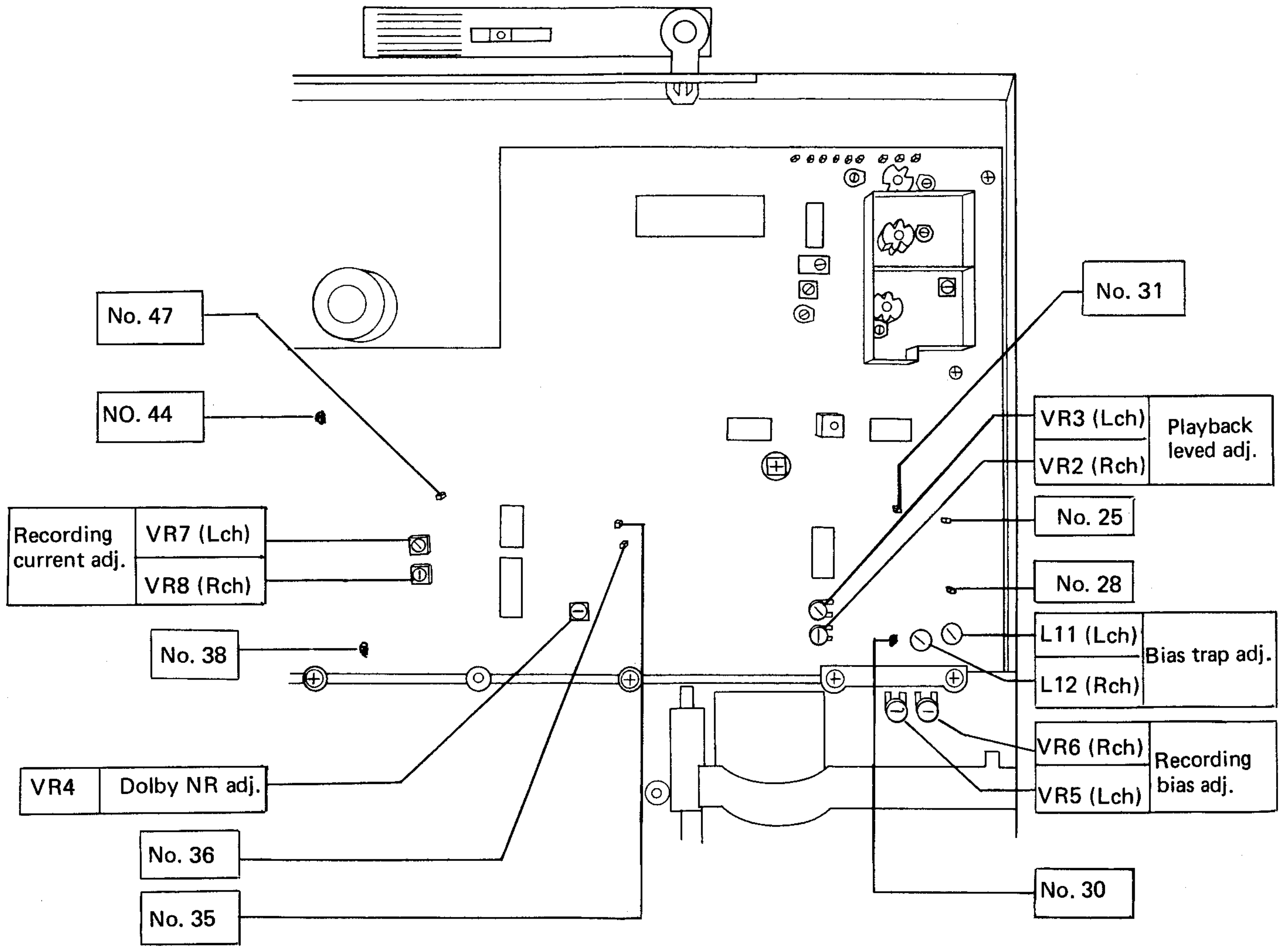

No. 47
NO. 44
Recording current adj.
VR7 (Lch)
VR8 (Rch)
No. 38
VR4
Dolby NR adj.
No. 36
No. 35
No. 31
VR3 (Lch)
VR2 (Rch)
Playback leved adj.
No. 25
No. 28
L11 (Lch)
L12 (Rch)
Bias trap adj.
VR6 (Rch)
VR5 (Lch)
Recording bias adj.
No. 30

Fig. 13-18 Adjustment and measuring points

13. RÉGLAGE

13.1 RÉGLAGES DE LA SECTION TUNER

- La fréquence reçue est changée par degrés (0,1 MHz sur la bande FM et 9kHz sur la bande AM) en appuyant une fois sur la touche TUNING UP ou DOWN. La fréquence change rapidement en appuyant continuellement sur une des deux touches.

Section FM

- Effectuer les connexions comme indiqué sur la Fig. 13-1.
- Régler le sélecteur de fonctions sur la position TUNER FM.
- Régler les capaciteurs de compensation TC1, TC2 et TC3 sur la capacitance moyenne.

1. Lors du réglage alternatid de 2 fréquences différentes pendant un réglage particulier, ces fréquences peuvent être préréglées dans la mémoire (MX-80) afin de simplifier l'opération.
2. Principal 1kHz. Gauche+Droit (L+R). ±67,5 kHz déviation, pilote 19kHz±7,5kHz déviation.
3. Signaux de sortie des broches 16 (canal gauche) et 18 (canal droit) d'assemblage de commutation (AWX-210).

Phase	FM SG (400Hz, ±75kHz déviation)		Affichage de la fréquence MX-80	Point de réglage	Méthode de réglage
	Fréquence	Niveau			
1	Pas de signal		87,5MHz	L3	Régler afin d'obtenir une tension CC de 6,5V à la borne n° 54.
2			108MHz	TC3	Régler afin d'obtenir une tension CC de 20V à la borne n° 54.
3	Répéter les phases 1 et 2 afin d'obtenir les conditions requises.				
4	90MHz	Environ 15dB	90MHz	L1, L2	Régler afin d'obtenir la tension CC maximum à la borne n° 56.
5	106MHz		106MHz	TC1, TC2	
6	Répéter les phases 4 et 5 afin d'obtenir la sensibilité maximum.				
7	98MHz	Environ 15dB	98MHz	T1	Régler afin d'obtenir la tension CC maximum à la borne n° 56.
8		86dB		T2	Régler afin d'obtenir une tension CC de 0,1V aux bornes n° 51 et n° 52.
9	98MHz Pas de modulation	86dB		VR1	Régler afin que la fréquence à la borne n° 50 soit 19kHz± 100Hz.
10	98MHz (*2) Régler sur la modulation stéréophonique.	86dB		T1	(*3) Régler afin d'obtenir une distorsion minimum.
11	98MHz	Environ 40dB		S'assurer que le circuit d'atténuation ne fonctionne pas au dessus de 40dB. Dans le cas contraire, enlever R50.	

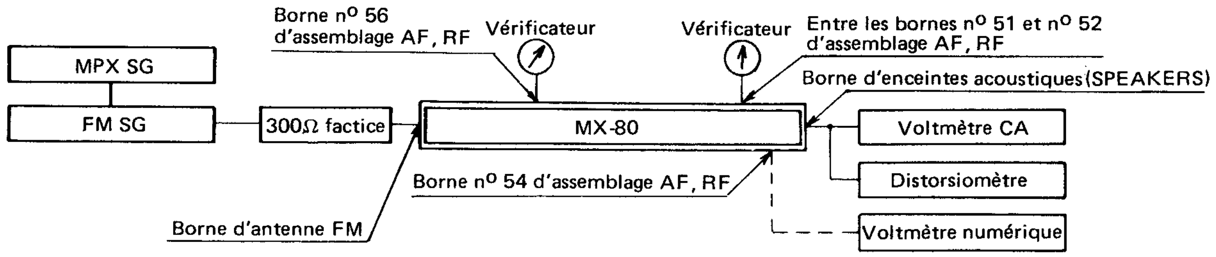

Borne n° 56 d'assemblage AF, RF
Vérificateur
Vérificateur
Entre les bornes n° 51 et n° 52 d'assemblage AF, RF
Borne d'enceintes acoustiques (SPEAKERS)
MPX SG
FM SG
300Ω factice
MX-80
Voltmètre CA
Distorsiomètre
Borne n° 54 d'assemblage AF, RF
Voltmètre numérique
Borne d'antenne FM

Fig. 13-1 Connexion pour le réglage du tuner FM

Section AM

- Effectuer les connexions comme indiqué sur la Fig. 13-2.
- Régler le sélecteur de fonctions sur la position TUNER AM.
- Régler les capaciteurs de compensation TC4 et TC5 sur la capacitance moyenne.

Phase	AM SG (400Hz, 30% modulation)		Affichage de la fréquence MX-80	Point de réglage	Méthode de réglage
	Fréquence	Niveau			
1	Pas de signal		522kHz	L5	Régler afin d'obtenir une tension CC de 2V à la borne n° 54.
2			1602kHz	TC5	Régler afin d'obtenir une tension CC de 25V à la borne n° 54.
3	Répéter les phases 1 et 2 afin d'obtenir les conditions requises.				
4	603kHz	Environ 40dB	603kHz	Antenne -tige	Régler afin d'obtenir la tension CC maximum à la borne n° 56.
5	1395kHz		1395kHz	TC4	
6	Répéter les phases 4 et 5 afin d'obtenir la sensibilité maximum.				
7	999kHz	Environ 40dB	999kHz	F3	Régler afin d'obtenir la tension CC maximum à la borne SPEAKERS.

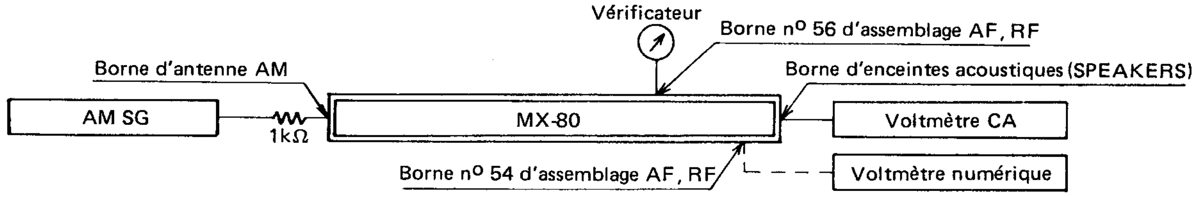

Vérificateur
Borne n° 56 d'assemblage AF, RF
Borne d'antenne AM
Borne d'enceintes acoustiques (SPEAKERS)
AM SG
1kΩ
MX-80
Voltmètre CA
Borne n° 54 d'assemblage AF, RF
Voltmètre numérique

Fig. 13-2 Connexion pour le réglage du tuner AM

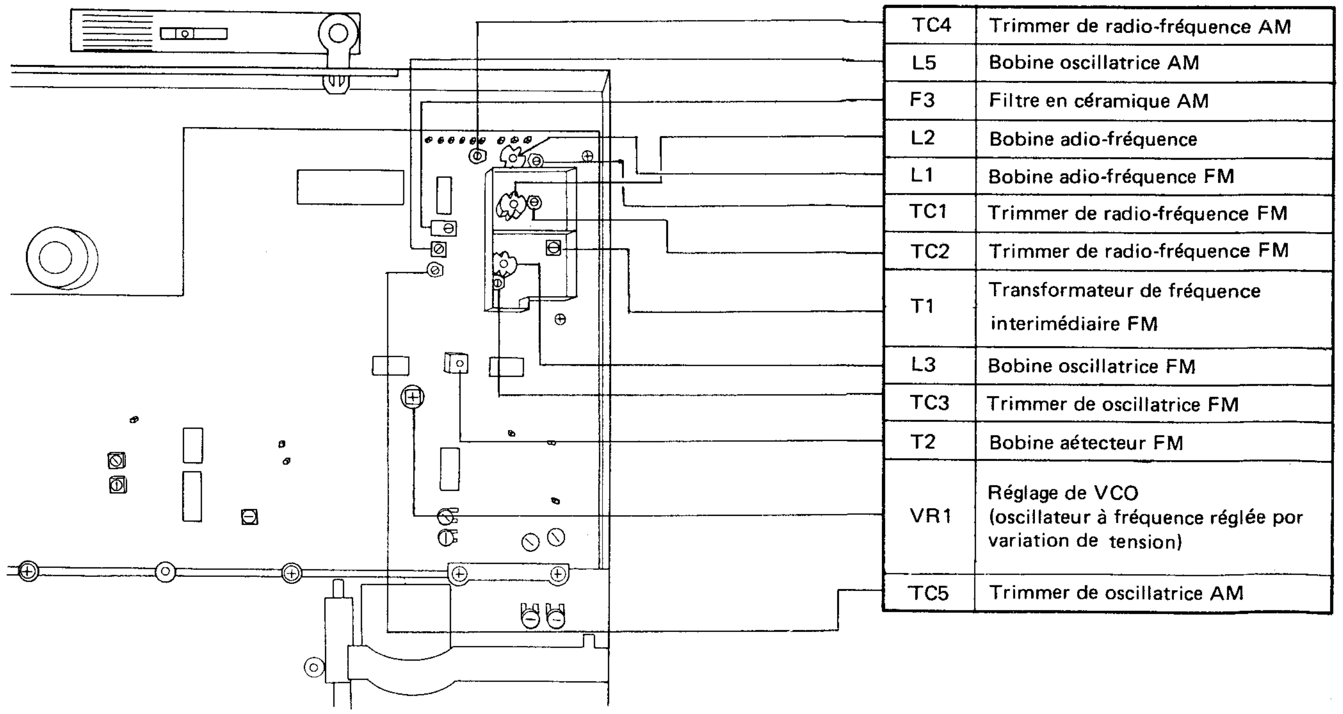

TC4 Trimmer de radio-fréquence AM
L5 Bobine oscillatrice AM
F3 Filtre en céramique AM
L2 Bobine adio-fréquence
L1 Bobine adio-fréquence FM
TC1 Trimmer de radio-fréquence FM
TC2 Trimmer de radio-fréquence FM
T1 Transformateur de fréquence interimédiaire FM
L3 Bobine oscillatrice FM
TC3 Trimmer de oscillatrice FM
T2 Bobine aétecteur FM
VR1 Réglage de VCO (oscillateur à fréquence réglée por variation de tension)
TC5 Trimmer de oscillatrice AM

Fig. 13-3 Réglage et points de mesure

13.2 RÉGLAGES DE LA PLATINE TOURNE-DISQUE

13.2.1 Vitesse de rotation (t.p.m.)

Remarques:

- *Régler d'abord la vitesse de rotation de 33 t.p.m. Le bras de lecture se déplaçant pendant le réglage, la protection de la pointe de lecture doit être fixée sur la pointe de lecture.*
- *L'orifice de fixation de la courroie de la platine tourne-disque est utilisé pour le réglage.*

1. Régler l'interrupteur principal, les commutateurs PHONO et 33 (SPEED) sur la position ON.
2. Diriger le bras de lecture manuellement vers le centre de la platine tourne-disque afin de déclencher la rotation du plateau et vérifier la vitesse de rotation à l'aide du stroboscope.
3. Replacer le bras de lecture manuellement sur le repose-bras afin d'arrêter la rotation de la platine tourne-disque.
4. Régler VR1.
5. Effectuer de nouveau les opérations indiquées dans les chapitres 2, 3 et 4 afin d'obtenir la vitesse correcte.
6. Régler le commutateur 45 (SPEED) sur la position ON et régler VR2 (de la même manière que pour le réglage de la vitesse de 33 t.p.m.) afin d'effectuer le réglage de la vitesse de 45 t.p.m.

13.2.2 Position de descente de la pointe de lecture

1. Placer un disque microsillon de 30cm sur le plateau de la platine tourne-disque.
2. Régler le sélecteur SIZE sur 30cm et appuyer sur le commutateur START/CUT afin de déclencher la platine tourne-disque. Pendant cette opération, noter la point de descente de la pointe de lecture sur le disque.
3. Appuyer de nouveau sur le commutateur START/CUT afin d'arrêter le mouvement du plateau et régler la vis de réglage de position de descente da la pointe de lecture.
4. Effectuer de nouveau les opération indiquées dans les chapitres 2 et 3 ci-dessus afin que la pointe de lecture descende avec précision sur le sillon de départ du disque. Effectuer ensuite les mêmes réglages avec un disque de 17cm.

Réglage à l'aide de disques d'essai

Ce réglage de la position de descente de la pointe de lecture doit être effectué en plaçant d'abord le bras de lecture sur le repose-bras.

Position de descente des disques 30cm	306 à 313
Position de descente des disques 17cm	175 à 183

13.2.3 Réglage de retour automatique

1. Dégager la courroie de la poulie du moteur et retirer la plateau de la platine tourne-disque.
2. Tourner complètement la vis de réglage de retour automatique dans le sens des aiguilles d'une montre.
3. Placer le bras de lecture au centre de la platine tourne-disque.
4. Tourner peu à peu la vis de réglage de retour automatique dans le sens contraire des aiguilles d'une montre. Le bras de lecture se déplace alors vers le bord extérieur de la platine tourne-disque.
5. Arrêter de tourner la vis lorsque la pointe de lecture est éloignée de 33mm de l'axe central.
6. S'assurer que le fonctionnement du retour automatique est correct après avoir effectué le réglage.

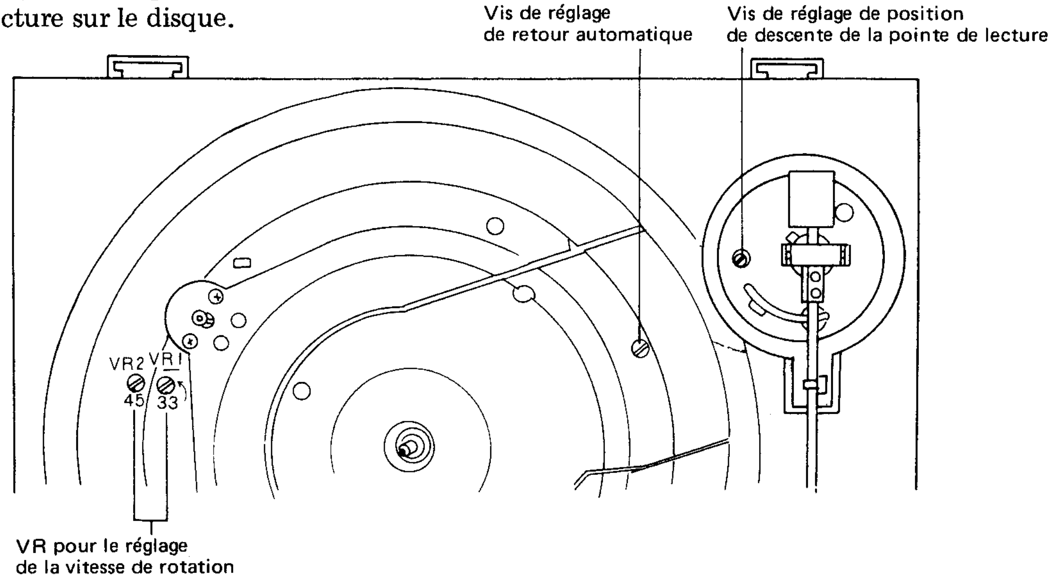

Vis de réglage de retour automatique
Vis de réglage de position de descente de la pointe de lecture
VR2
VR1
45
33
VR pour le réglage de la vitesse de rotation

Fig. 13-4 Réglage et points de mesure

13.3 RÉGLAGE MÉCANIQUE DE LA PLATINE POUR CASSETTE

13.3.1 Réglage de la pression du galet-presseur

1. Régler la platine pour cassette sur le mode de reproduction sans introduire de cassette.
2. Pousser doucement le bras du galet-presseur avec l'appareil mesureur de tension (pièce n° GGK-047) et séparer légèrement le galet-presseur du cabestan.
3. Remettre ensuite le galet-presseur sur le cabestan et consulter l'indication lorsque le galet-presseur commence à tourner. Remplacer le ressort du galet-presseur lorsque l'indication est inférieure à 200-250g (pièce n° RBH-742).

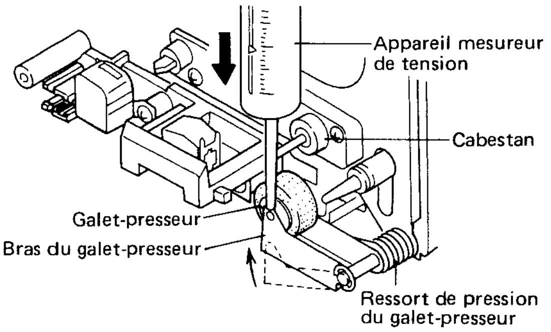

Appareil mesureur de tension
Cabestan
Galet-presseur
Bras du galet-presseur
Ressort de pression du galet-presseur

Fig. 13-5 Réglage de la pression du galet-presseur

13.3.2 Réglage du couple du support de bobine

Mesurer le couple avec le torsiomètre (pièce n° GGK-056) pendant la reproduction, l'avance rapide (FF) et le rebobinage (REW). En général l'indication de valeur de couple doit être égale ou inférieure aux indications de valeur permise indiquées dans le tableau 1.

Lorsque la valeur indiquée est supérieure à la valeur permise, remplacer le support de bobine réceptrice et/ou le support de bobine débitrice, le galet de renvoi récepteur, ou le bras d'entraînement.

Tableau 1

	Support de bobine réceptrice	Support de bobine débitrice
Mode de reproduction	35 – 55g-cm	*2 – 5g-cm
Mode d'avance rapide (FF)	75 – 110g-cm	*2 – 5g-cm
Mode de rebobinage (REW)	*2 –5g-cm	75 – 110g-cm

** Indique le couple de tension arrière.*

13.3.3 Réglage de la vitesse de la bande

1. Raccorder le mesureur de fréquence sur les bornes n° 35 (canal gauche) et/ou n° 36 (canal droit) d'assemblage AF, RF.
2. Procéder à la reproduction de la partie de 3kHz de la bande de vérification STD-301. Au début, l'indication du mesureur de fréquence doit être égale ou inférieure à 3000~3010Hz, et peut être réglée en tournant le résisteur semi-fixe situé dans l'orifice de réglage du moteur du cabestan comme indiqué sur la Fig. 13-6.

La vitesse de la bande augmente en tournant le résisteur semi-fixe dans le sens des aiguilles d'une montre et diminue en tournant le résisteur dans le sens contraire des aiguilles d'une montre.

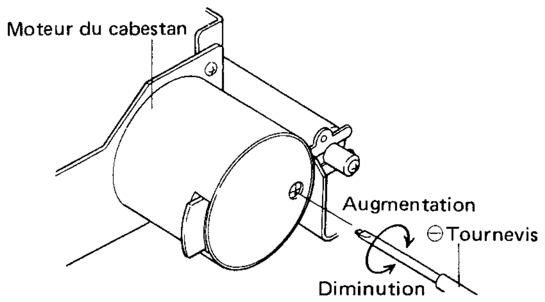


Fig. 13-6 Réglage de la vitesse de la bande

13.3.4 Réglage du solénoïde d'avance rapide

1. Régler la platine sur le mode d'avance rapide (FF).
2. Desserrer les vis ❶ et régler la position de fixation du solénoïde d'avance rapide afin que l'orifice carré du support des bobines soit encastré dans le moyeu du bras d'entraînement (c'est à dire la séparation 0) comme indiqué sur la Fig. 13-7.

13.3.5 Réglage du solénoïde de rebobinage (REW)

1. Régler la platine sur le mode de rebobinage (REW).
2. Desserrer les vis ❷ et régler la position de fixation du solénoïde de rebobinage afin que l'orifice carré du support des bobines soit encastré dans le moyeu du bras d'entraînement (c'est à dire la séparation 0) comme indiqué sur la Fig. 13-7.

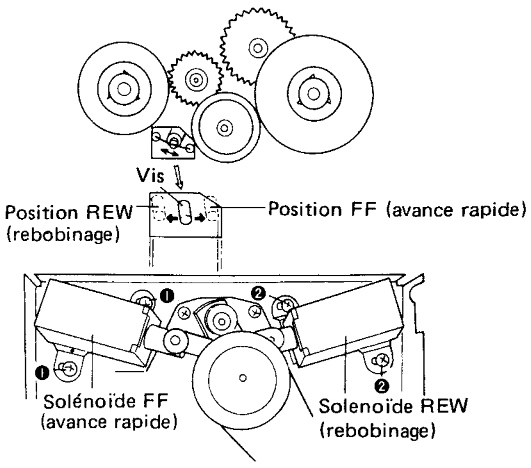

Vis
Position REW (rebobinage)
Position FF (avance rapide)
❶
❷
Solénoïde FF (avance rapide)
Solenoïde REW (rebobinage)

Fig. 13-7 Réglage du solénoïde FF (REW) (avance rapide/rebobinage)

13.4 RÉGLAGES ÉLECTRIQUES DE LA PLATINE POUR CASSETTE

Précautions à prendre

1. Le réglage mécanique doit être effectué avant le réglage électrique.
2. Nettoyer les éléments suivants avec un chiffon imbibé d'alcool: la tête de reproduction/enregistrement, le galet-presseur, la tête d'effacement, les courroies en caoutchouc et le cabestan.
3. Démagnétiser la tête de reproduction/enregistrement avec un démagnétiseur de tête.
4. Ne pas utiliser de tournevis aimanté pour effectuer les réglages.
5. Les réglages et le mesurage doivent être effectués pour le canal gauche et le canal droit sur la tension d'alimentation nominale.
6. Les réglages doivent être effectués dans l'ordre indiqué dans le manuel d'instructions. Les réglages effectués dans un ordre différent peuvent provoquer une altération des performances.
7. Le niveau pendant le mesurage est basé sur 0dBv=1V. Raccorder un résisteur factice de 50kΩ (47~52kΩ) sur les bornes OUTPUT.
8. Mettre sous tension le MX-80 et le réchauffer pendant quelques minutes avant d'effectuer les réglages.
9. Régler le commutateur de réduction de bruit Dolby (DOLBY NR) sur la position OFF et le sélecteur de bande (TAPE SELECT) sur la position NORM sauf indication contraire.

Appareils d'essai/outils nécessaires:

1. Bande de vérification

STD-341	Pour le réglage de la reproduction
STD-608A	Bande vierge NORMAL
STD-603	Bande vierge CrO_2
STD-604	Bande vierge METAL

2. Oscillateur audio
3. Millivoltmètre CA (CA mV)
4. Atténuateur
5. Oscilloscope
6. Résisteur 50kΩ (47~52kΩ)

13.4.1 Réglage de l'azimut de la tête

Réglage

Mode	Reproduction
Bande de vérification	STD-341A (10kHz, -20dB)
Millivoltmètre CA	n° 35 (canal gauche) et n° 36 (canal droit) d'assemblage AF, RF

Méthode

Régler la vis de réglage de l'azimut afin d'obtenir l'indication maximum du millivoltmètre pour le canal gauche et le canal droit. Bloquer la vis avec la vis de blocage après avoir effectué ce réglage.

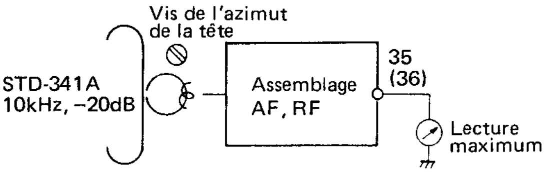

Vis de l'azimut de la tête
STD-341A
10kHz, –20dB
Assemblage AF, RF
35
(36)
Lecture maximum

Fig. 13-8 Réglage de l'azimut de la tête

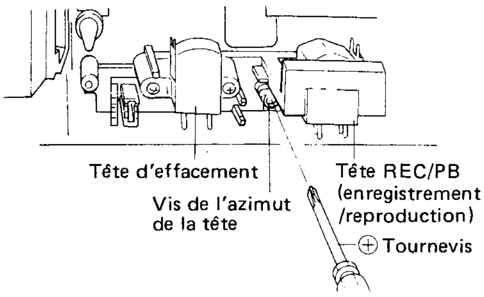

Tête d'effacement
Vis de l'azimut de la tête
Tête REC/PB (enregistrement /reproduction)
⊕ Tournevis

Fig. 13-9 Réglage de l'azimut de la tête

13.4.2 Réglage d'égalisation de reproduction

Réglage

Mode	Reproduction
Bande de vérification	STD-314A (333Hz et 6,3kHz, - 20dB)
Millivoltmètre CA	n° 35 (canal gauche) et n° 36 (canal droit) d'assemblage AF, RF

Méthode

1. Régler le sélecteur de bande (TAPE SELECT) sur la position NORMAL. Effectuer la reproducion de la partie de 333Hz et 6,3kHz de la bande STD-341A, et vérifier que la différence entre les deux niveaux de sortie n'est pas supérieure à 0dB±1,5dB.
2. Régler ensuite le sélecteur de bande (TAPE SELECT) sur la position METAL. Effectuer de nouveau la reproduction de la partie de 333Hz et 6,3kHz de la bande STD-314A, et vérifier que la différence entre les deux niveaux de sortie n'est pas supérieure à - 3,5dB±1,5dB.

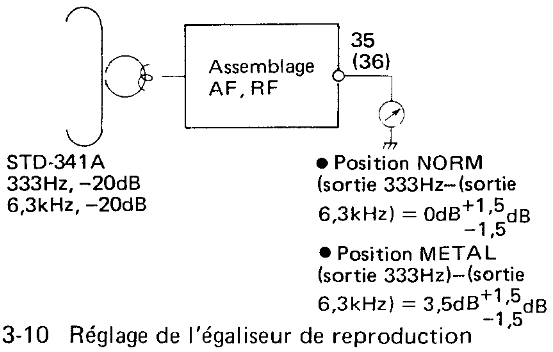

Assemblage AF, RF
35
(36)
STD-341A
333Hz, –20dB
6,3kHz, –20dB
● Position NORM
(sortie 333Hz–(sortie 6,3kHz) = 0dB$^{+1,5}_{-1,5}$dB
● Position METAL
(sortie 333Hz)–(sortie 6,3kHz) = 3,5dB$^{+1,5}_{-1,5}$dB

Fig. 13-10 Réglage de l'égaliseur de reproduction

13.4.3 Réglage du niveau de reproduction

Ce réglage déterminant le niveau de réduction de bruit Dolby (DOLBY NR) pendant la reproduction, il est important d'effectuer ce réglage avec précision.

Réglage

Mode	Reproduction
Bande de vérification ..	STD-341A (333Hz, 0dB)
Millivoltmètre CA	n° 35 (canal gauche) et n° 36 (canal droit) d'assemblage AF, RF

Méthode

Régler VR3 (canal gauche) et VR2 (canal droit) afin que le millivoltmètre CA indique -0,6dBv (0,93V).

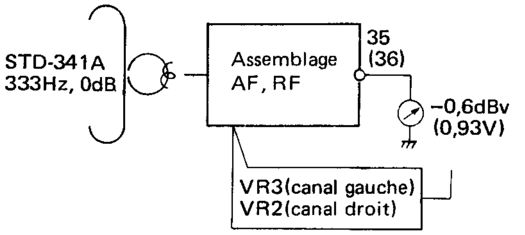

STD-341A
333Hz, 0dB
Assemblage
AF, RF
35
(36)
−0,6dBv
(0,93V)
VR3(canal gauche)
VR2(canal droit)

Fig. 13-11 Réglage du niveau de reproduction

13.4.4 Réglage de l'éliminateur de polarisation

Réglage

Mode	Enregistrement
Sélecteur de bande (TAPE SELECT)	METAL
Oscilloscope	n° 44 (canal gauche) et n° 38 (canal droit) d'assemblage AF, RF
Signal d'entrée	Pas de signal

Méthode

Régler L11 (canal gauche) et L12 (canal droit) afin de réduire au minimum le niveau de perte de polarisation.

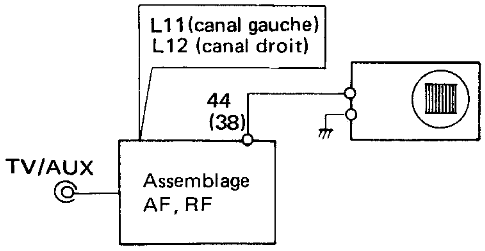

L11(canal gauche)
L12 (canal droit)
44
(38)
TV/AUX
Assemblage
AF, RF

Fig. 13-12 Réglage d'éliminateur de polarisation

13.4.5 Réglage du courant d'enregistrement

Le niveau étant extrêmement bas, effectuer ce réglage en prenant soin d'éviter le bruit d'induction externe.

Réglage

Mode	Enregistrement
Millivoltmètre CA	n° 35 (canal gauche) et n° 36 (canal droit) d'assemblage AF, RF
Signal d'entrée	333Hz, environ -8dBv (400mV) aux bornes TV/AUX

Méthode

1. Régler l'atténuateur afin que le millivoltmètre CA indique -2,2dBv (0,755V).
2. Raccorder le câble d'interconnexion entre les bornes n° 72 et n° 76 du bloc OSC. Raccorder ensuite le millivoltmètre CA entre les bornes n° 25 et n° 31 (canal gauche) et entre les bornes n° 28 et n° 30 (canal droit) d'assemblage AF, RF.
3. Régler VR7 (canal gauche) et VR8 (canal droit) afin que le millivoltmètre CA indique -66dBv (0,5mV).
4. Déconnecter le câble d'interconnexion.

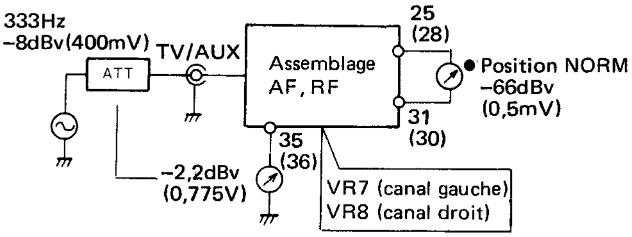

333Hz
−8dBv(400mV)
TV/AUX
ATT
Assemblage
AF, RF
25
(28)
● Position NORM
−66dBv
(0,5mV)
31
(30)
35
(36)
−2,2dBv
(0,775V)
VR7 (canal gauche)
VR8 (canal droit)

Fig. 13-13 Réglage du courant d'enregistrement

13.4.6 Réglage de la polarisation d'enregistrement

Le réglage précis de la polarisation d'enregistrement est effectué lors du réglage de réponse d'enregistrement/reproduction indiqué dans le chapitre 13.4.7.

Réglage

Mode	Enregistrement
Millivoltmètre CA	Entre les bornes n° 25 et n° 31 (canal gauche) et n° 28 et n° 30 (canal droit) d'assemblage AF, RF
Signal d'entrée	Pas de signal

Méthode

Régler VR5 (canal gauche) et VR6 (canal droit) du bloc OSC afin que le millivoltmètre CA indique 3,3mV.

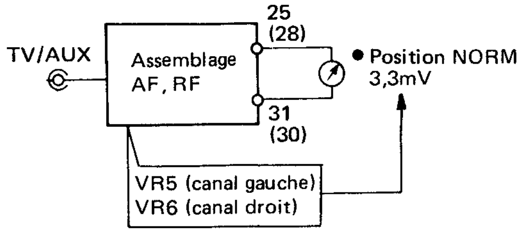

25
(28)
TV/AUX
Assemblage AF, RF
● Position NORM
3,3mV
31
(30)
VR5 (canal gauche)
VR6 (canal droit)

Fig. 13-14 Réglage de la polarisation d'enregistrement

13.4.7 Réglage de réponse d'enregistrement/reproduction

Réglage

Mode	Enregistrement/reproduction
Bande de vérification ..	STD-608A
Millivoltmètre CA	n° 35 (canal gauche) et n° 36 (canal droit) d'assemblage AF, RF
Signal d'entrée	333Hz, environ -33dBv (22,4mV) aux bornes TV/AUX
Sélecteur de fonctions .	TV/AUX

Méthode

1. Régler le niveau de signal d'entrée avec l' atténuateur afin que le millivoltmètre CA indique -27,2dBv (43mV).
2. Enregistrer les signaux de 1kHz et 10kHz sur la bande STD-608A.
3. Effectuer la reproduction de la bande et régler VR5 (canal gauche) et VR6 (canal droit) afin que la différence entre les deux sorties soit 0dB±1dB à 10kHz.

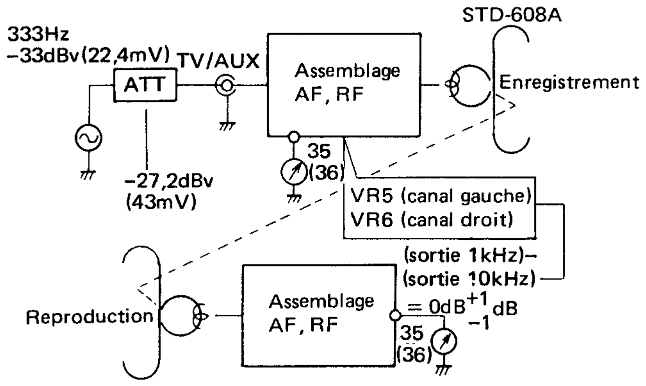

333Hz
-33dBv(22,4mV)
TV/AUX
ATT
-27,2dBv
(43mV)
Assemblage AF, RF
STD-608A
Enregistrement
35
(36)
VR5 (canal gauche)
VR6 (canal droit)
(sortie 1kHz)–
(sortie 10kHz)
= 0dB+1 -1 dB
Reproduction
Assemblage AF, RF
35
(36)

Fig. 13-15 Réglage de l'enregistrement/reproduction

13.4.8 Réglage du niveau d'enregistrement

Ce réglage déterminant le niveau de réduction de bruit Dolby (DOLBY NR) pendant la reproduction, il est important d'effectuer ce réglage avec précision.

Réglage

Mode	Enregistrement/reproduction
Bande de vérification ..	STD-608A
Millivoltmètre CA	n° 35 (canal gauche) et n° 36 (canal droit) d'assemblage AF, RF
Signal d'entrée	333Hz, environ -18dBv (125mV) aux bornes TV/AUX

Méthode

1. Régler le niveau de signal d'entrée avec l' atténuateur afin que le millivoltmètre CA indique -12,2dBv (245mV).
2. Enregistrer les signaux de 333Hz sur la bande STD-608A. Effectuer la reproduction de la bande et régler VR7 (canal gauche) et VR8 (canal droit) afin que le millivoltmètre CA indique -12,2dBv (245mV).

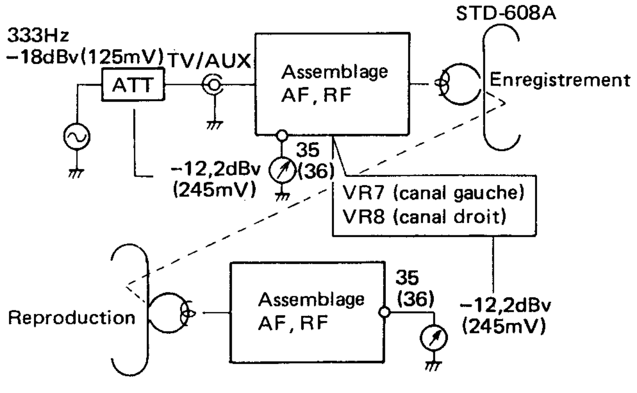

333Hz
-18dBv(125mV)
TV/AUX
ATT
-12,2dBv
(245mV)
Assemblage AF, RF
STD-608A
Enregistrement
35
(36)
VR7 (canal gauche)
VR8 (canal droit)
Reproduction
Assemblage AF, RF
35
(36)
-12,2dBv
(245mV)

Fig. 13-16 Réglage du niveau d'enregistrement

13.4.9 Réglage du réducteur de bruit Dolby (DOLBY NR)

Réglage

Mode	Enregistrement
Millivoltmètre CA	n° 35 (canal gauche) et n° 36 (canal droit) d'assemblage AF, RF
Signal d'entrée	2kHz, -28dBv (40mV) aux bornes TV/AUX
Sélecteur de fonctions .	TV/AUX
VR4	Position centrale

Méthode

1. Réglar le niveau de signal d'entrée avec l' atténuateur afin que le millivoltmètre CA indique -22,2dBv (77,5mV).
2. Raccorder ensuite le millivoltmètre CA entre la borne n° 47 d'assemblage AF, RF et la terre. Régler ensuite le commutateur de réduction de bruit Dolby (DOLBY NR) sur la position ON.
3. Régler VR4 afin que le millivoltmètre indique -17,9dBv (127mV).

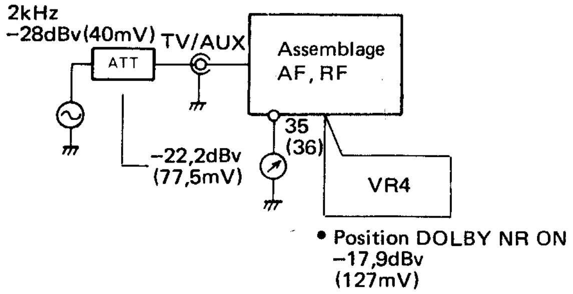

2kHz
-28dBv(40mV)
TV/AUX
ATT
Assemblage AF, RF
35
(36)
-22,2dBv
(77,5mV)
VR4
● Position DOLBY NR ON
-17,9dBv
(127mV)

Fig. 13-17 Réglage du réducteur de bruit Dolby

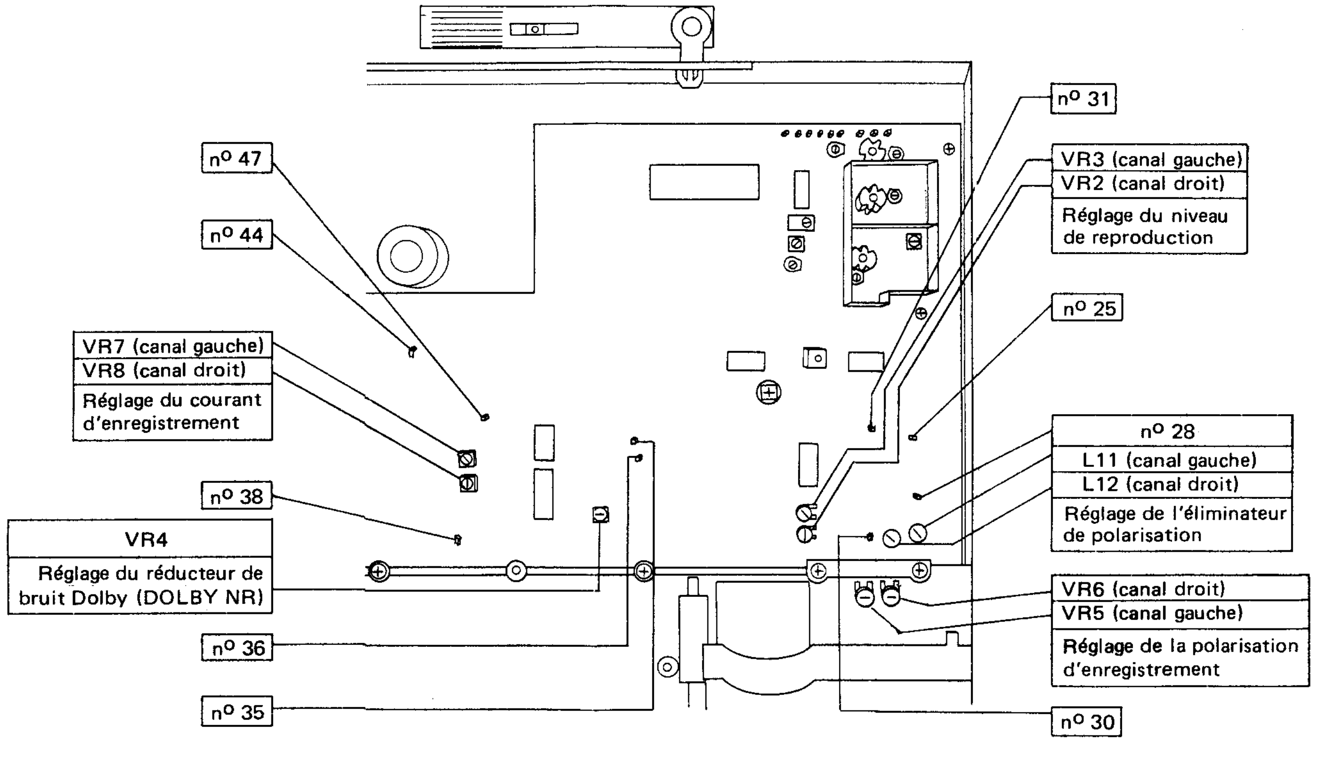

n° 47
n° 44
VR7 (canal gauche)
VR8 (canal droit)
Réglage du courant d'enregistrement
n° 38
VR4
Réglage du réducteur de bruit Dolby (DOLBY NR)
n° 36
n° 35
n° 31
VR3 (canal gauche)
VR2 (canal droit)
Réglage du niveau de reproduction
n° 25
n° 28
L11 (canal gauche)
L12 (canal droit)
Réglage de l'éliminateur de polarisation
VR6 (canal droit)
VR5 (canal gauche)
Réglage de la polarisation d'enregistrement
n° 30

Fig. 13-18 Réglage et points de mesure

13. AJUSTE

13.1 AJUSTES DE LA SECCIÓN DEL SINTONIZADOR

- La frecuencia recibida se cambia un paso cada vez (en pasos de 0,1MHz en la banda de FM y en pasos de 9kHz en la banda de AM) cada vez que se presionan los botones TUNING UP o DOWN. La frecuencia va cambiando rápidamente si se presiona uno de los botones de forma continua.

Sección de FM

- Conectar como se muestra en la Fig. 13-1.
- Poner el selector de función en la posición TUNER FM.
- Ajustar los compensadores TC1, TC2 y TC3 aproximadamente en los valores centrales de capacitancia.

1. Cuando se ajuste a dos frecuencias distintas alternamente durante un procedimiento de ajuste en particular, tales frecuencias podrán preajustarse en la memoria (MX-80) a fin de simplificar la operación.
2. Principal: 1kHz — Izquierdo+Derecho (L+R), ±67,5kHz de desviación; piloto: 19kHz — ±7,5kHz de desviación.
3. Las señales de salida de los terminales 16 (canal izquierdo) y 18 (canal derecho) del conjunto conmutador (AWX-210).

Paso	FM SG (400Hz, ±75kHz desviación)		Frecuencímetro del MX-80	Punto de ajuste	Procedimientos de ajuste
	Frecuencia	Nivel			
1	Sin señal		87,5MHz	L3	Ajustar de modo que la tensión de CC en el terminal no. 45 sea de 6,5V.
2			108MHz	TC3	Ajustar de modo que la tensión de CC en el terminal no. 54 sea de 20V.
3	Repetir los pasos 1 y 2 hasta que se satisfagan ambos requisitos.				
4	90MHz	15dB aprox.	90MHz	L1, L2	Ajustar de modo que la tensión de CC en el terminal no. 56 sea la máxima.
5	106MHz		106MHz	TC1, TC2	
6	Repetir los pasos 4 y 5 hasta lograrse la máxima sensibilidad.				
7	98MHz	15dB aprox.	98MHz	T1	Ajustar de modo que la tensión de CC en el terminal no. 56 sea la máxima.
8		86dB		T2	Ajustar de modo que la tensión de CC entre los terminales no. 51 y 52 sea de 0,1V.
9	98MHz Sin modulación	86dB		VR1	Ajustar de modo que la frecuencia en el terminal no. 50 sea de 19kHz±100Hz.
10	98MHz (*2) Establecer a modulación estereofónca	86dB		T1	(*3) Ajustar de modo que la distorsión sea la mínima.
11	98MHz	40dB aprox.		Comprobar que el circuito de silenciamiento no esté funcionando por encima de los 40dB. Si no es así, extrear R50.	

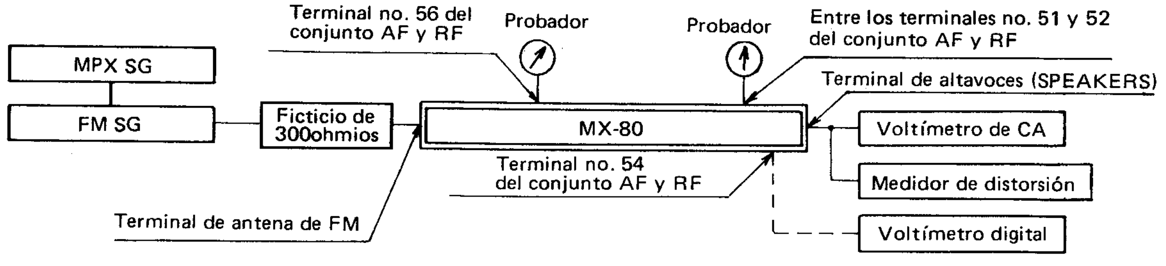

Terminal no. 56 del conjunto AF y RF
Probador
Probador
Entre los terminales no. 51 y 52 del conjunto AF y RF
Terminal de altavoces (SPEAKERS)
MPX SG
FM SG
Ficticio de 300ohmios
MX-80
Voltímetro de CA
Terminal no. 54 del conjunto AF y RF
Medidor de distorsión
Terminal de antena de FM
Voltímetro digital

Fig. 13-1 Conexión para el ajuste del sintonizador de FM

Sección de AM

- Conectar como se muestra en la Fig. 13-2.
- Poner el selector de función en la posición TUNER AM.
- Ajustar los compensadores TC4 y TC5 aproximadamente a los valores centrales de capacitancia.

Paso	AM SG (400Hz, 30% modulación)		Frecuencímetro del MX-80	Punto de ajuste	Procedimientos de ajuste
	Frecuencia	Nivel			
1	Sin señal		522kHz	L5	Ajustar de modo que la tensión de CC en el terminal no. 54 sea de 2V.
2			1602kHz	TC5	Ajustar de modo que la tensión de CC en el terminal no. 54 sea de 25V.
3	Repetir los pasos 1 y 2 hasta que se satisfagan ambos requisitos.				
4	603kHz	40dB aprox.	603kHz	Antena de barra	Ajustar de modo que la tensión de CC en el terminal no. 56 sea la máxima.
5	1395kHz		1395kHz	TC4	
6	Repetir los pasos 4 y 5 hasta lograrse la máxima sensibilidad.				
7	999kHz	40dB aprox.	999kHz	F3	Ajustar de modo que la tensión de CC en el terminal SPEAKERS sea la máxima.

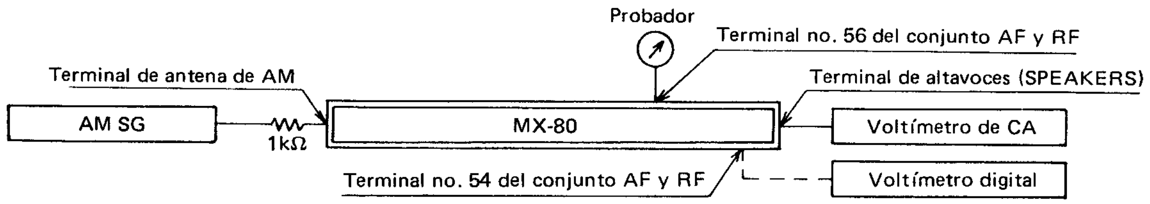

Probador
Terminal no. 56 del conjunto AF y RF
Terminal de antena de AM
Terminal de altavoces (SPEAKERS)
AM SG
1kΩ
MX-80
Voltímetro de CA
Terminal no. 54 del conjunto AF y RF
Voltímetro digital

Fig. 13-2 Conexión para el ajuste del sintonizador de AM

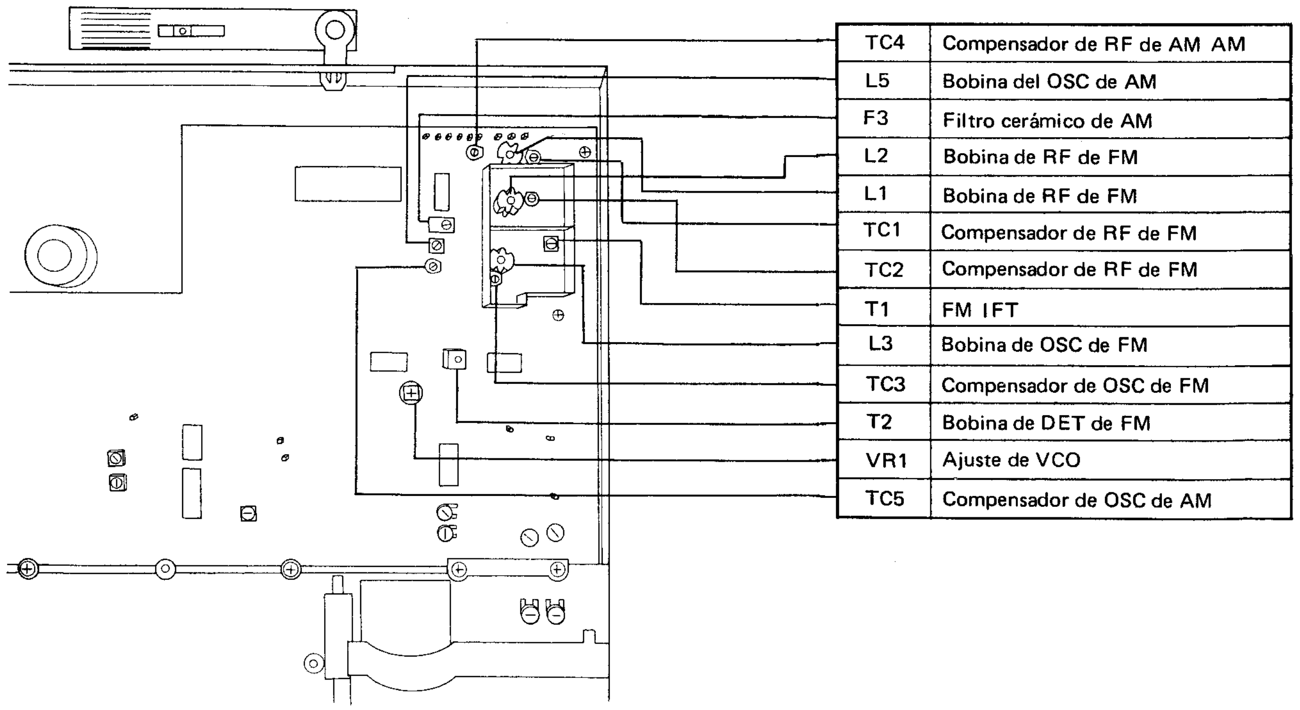

TC4 Compensador de RF de AM AM
L5 Bobina del OSC de AM
F3 Filtro cerámico de AM
L2 Bobina de RF de FM
L1 Bobina de RF de FM
TC1 Compensador de RF de FM
TC2 Compensador de RF de FM
T1 FM IFT
L3 Bobina de OSC de FM
TC3 Compensador de OSC de FM
T2 Bobina de DET de FM
VR1 Ajuste de VCO
TC5 Compensador de OSC de AM

Fig. 13-3 Puntos de ajuste y de medición

13.2 AJUSTES DE LA SECCIÓN DEL GIRADISCOS

13.2.1 Velocidad de rotación (RPM)

Notas:

- *En primer lugar se ajusta la velocidad de 33rpm. Y puesto que el brazo fonocaptor se mueve durante el ajuste, deberá ponerse la cubierta protectora de la aguja.*
- *El ajuste se realiza a través de la abertura de unión de la co-rea del giradiscos.*

1. Poner los interruptores POWER, PHONO y 33 (SPEED) en la posición ON.
2. Llevar el brazo fonocaptor a través del plato del giradiscos con la mano para poner en funcionamiento el giradiscos, y comprobar la velocidad de rotación con la placa estroboscopica.
3. Hacer volver el brazo fonocaptor con la mano a su posición de apoyo para detener el giradiscos.
4. Ajustar VR1.
5. Repetir los pasos 2, 3 y 4 hasta obtenerse la velocidad correcta.
6. Para el ajuste de 45rpm, ponerel interruptor 45 (SPEED) en la posición ON, y ajustar VR2 (del midmo modo descrito arriba para 33rpm).

13.2.2 Posición de descenso de la aguja

1. Poner un disco LP de 30cm sobre el plato del giradiscos.
2. Poner el selector SIZE en la posición para 30 cm y presionar el interruptor START/CUT para iniciar la reproducción. Obsérvese la posición donde desciende la aguja sobre el disco durante este paso.
3. Presionar de nuevo el interruptor de START/CUT para detener la reproducción y ajustar el tornillo de ajuste de la posición de descenso de la aguja.
4. Repetir los pasos 2 y 3 de arriba para obtener una posición precisa de descenso en el surco de inicio del disco. Luego repetirlo con un disco de 17cm

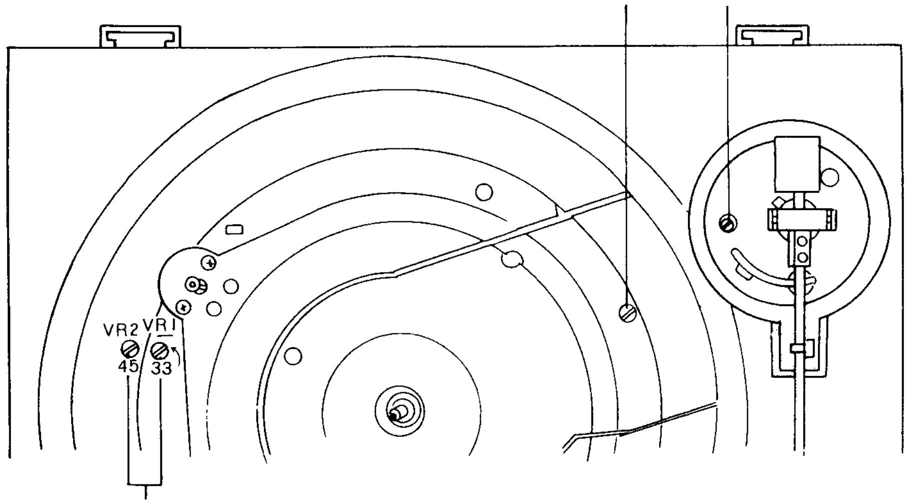
Al ajustar con discos de prueba

El ajuste de la posición de descenso de la aguja se realiza estando inicialmente el brazo fonocaptor en su posición de apoyo.

Posición de descenso de 30cm	Descender en el cómputo de 306 a 313.
Posición de descenso de 17cm	Descender en el cómputo de 175 a 183.

13.2.3 Ajuste de retorno automático

1. Sacar la correa de la polea del motor y extraer el plato del giradiscos.
2. Girar el tornillo de ajuste del retorno automático completamente hacia la derecha.
3. Llevar el brazo fonocaptor hacia el centro del giradiscos.
4. Girar el tornillo de ajuste poco a poco hacia la derecha. El brazo fonocaptor comenzará a moverse hacia el borde exterior del giradiscos.
5. Dejar de girar el tornillo cuando la punta de la aguja esté a 33mm del pivote central.
6. Una vez terminado el ajuste, comprobar que el retorno automático funciona correctamente.



Tornillo de ajuste de retorno automático

Tornillo de ajuste de la posición de descenso de la aguja

VR de ajuste de la velocidad de rotación

Fig. 13-4 Puntos de ajuste y de medición

13.3 AJUSTE MECÁNICO DEL MAGNETÓFONO DE CASETE

13.3.1 Ajuste de la presión del rodillo de presión

1. Establecer el magnetófono en el modo de reproducción sin cinta casete.
2. Presionar ligeramente el brazo del rodillo de presión con el calibrador de tensión (pieza no. GGK-047) y separar ligeramente el rodillo de presión del eje de arrastre.
3. Luego poner en su sitio el rodillo de presión sobre el eje de arrastre y leer el valor cuando el rodillo de presión comienza a girar. Si la lectura está dentro de 200~250g., recambiar el muelle del rodillo de presión (pieza no. RBH-742).

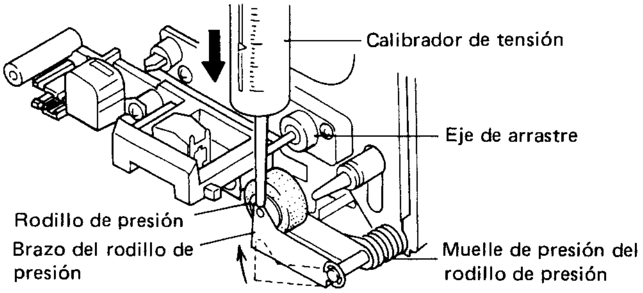

Calibrador de tensión
Eje de arrastre
Rodillo de presión
Brazo del rodillo de presión
Muelle de presión del rodillo de presión

Fig. 13-5 Ajuste de la presión del rodillo de presión

13.3.2 Ajuste del par de torsión de la base del carrete

Mediro el par de torsión con un medidor del par de torsión (pieza no. GGK-056) durante las funciones de reproducción, avance rápido (FF) y rebobinado (REW). Los valores medidos deberán normalmente estar dentro de los límites enumerados en la tabla 1.

Si los valores medidos no están dentro de los límites, recambiar el conjunto de la base del carrete de arrastre (TU) y/o el conjunto de la base del carrete de suministro, engranaje intermedio de arrastre (TU) o conjunto del brazo impulsor.

Tabla 1

	Base del carrete de arrastre	Base del carrete de suministro
Modo de reproducción	35 – 55g-cm	*2 – 5g-cm
Modo de avance rápido (FF)	75 – 110g-cm	*2 – 5g-cm
Modo de rebobinado (REW)	*2 – 5g-cm	75 – 110g-cm

**Indica el par de torsión posterior.*

13.3.3 Ajuste de la velocidad de la cinta

1. Conectar el frecuencímetro a los terminales no. 35 (canal izq.) y/o 36 (canal der.) del conjunto de AF y RF.
2. Reproducir la parte de 3kHz de la cinta de prueba STD-301. Al principio la frecuencia deberá estar dentro de los límites de 3000~3010Hz, y podrá ajustarse girando el resistor semifijo situado en el orificio de ajuste del motor del eje de arrastre como se muestra en la Fig. 13-6.

La velocidad aumenta girando el resistor semifijo hacia la derecha, y se reduce girándolo hacia la izquierda.

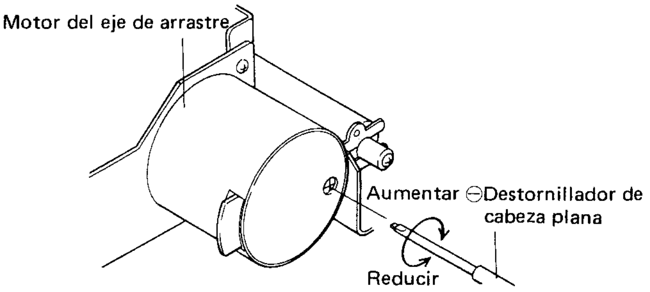


Fig. 13-6 Ajuste de la velocidad de la cinta

13.3.4 Ajuste del solenoide de avance rápido

1. Establecer el magnetófono en el modo de avance rápido.
2. Aflojar los tornillos ❶ y ajustar la posición de montaje del solenoide de avance rápido de modo que el orificio cuadrado del conjunto completo de la base del carrete quede empotrado contra el buje del conjunto completo del brazo impulsor (i.e. separación 0) como se muestra en la Fig. 13-7.

13.3.5 Ajuste del solenoide de rebobinado

1. Establecer el magnetófono en el modo de rebobinado.
2. Aflojar los tornillos ❷ y ajustar la posición de montaje del solenoide de rebobinado de modo que el orificio cuadrado del conjunto completo de la base del carrete quede empotrado contra el buje del conjunto completo del brazo impulsor (i.e. separación 0) como se muestra en la Fig. 13-7.

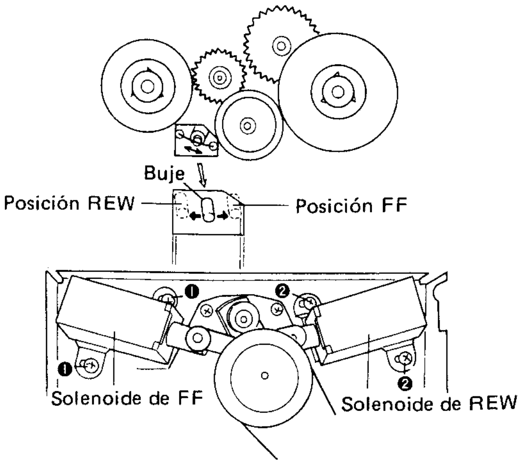


Fig. 13-7 Ajuste del solenoide de FF (REW)

13.4 ADUSTES ELÉCTRICOS DEL MAGNETÓFONO DE CASETE

Precaución

1. Deberá completarse el ajuste mecánico.
2. Limpiar las siguientes partes con un palillo de algodón humedecido en alcohol: Cabeza de grabación/reproducción, rodillo de presión, cabeza de borrado, correas de goma y eje de arrastre.
3. Desmagnetizar la cabeza de grabación/reproducción con un desmagnetizador de cabezas.
4. No utilizar destornilladores magnetizados para el ajuste.
5. Los ajustes y las mediciones deberán realizarse para los canales derecho y izquierdo con la tensión nominal de la alimentación.
6. Los ajustes deberán realizarse en el orden dado en este manual de servicio. Si se altera el orden se pueden impedir los ajustes correctos dando como resultado en una pérdida del rendimiento.
7. El nivel durante las mediciones se basa en 0dBv=1V. Conectar un resistor ficticio de 50k ohmios (47~52kohmios) a través de los terminales de salida (OUTPUT).
8. Dejar que se precaliente el MX-80 durante algunos minutos antes de proceder con el ajuste.
9. Poner el interruptor DOLBY NR en la posición OFF y el selector TAPE SELECT en la posición "Norm" a menos que se indique otra cosa.

Equipos/herramientas de prueba requeridos:

1. Cinta de prueba

STD-341A	Para ajuste de reproducción
STD-608A	Cintas normal en blanco
STD-603	Cinta de CrO_2 en blanco
STD-604	Cinta de metal en blanco

2. Oscilador de sonido
3. Voltímetro de CA (mV CA)
4. Atenuador
5. Osciloscopio
6. Resistor de 50kohmios (47~52kohmios)

13.4.1 Ajuste del azimut de la cabeza

Ajuste

Modo	Reproducción
Cinta de prueba	STD-341A (10kHz, -20dB)
Voltímetro de CA (mV)	no. 35 (canal izq.) y no. 36 (canal der.) del conjunto AF y RF.

Procedimiento

Ajustar le tornillo de ajuste del azimut para la indicación máxima del voltímetro de CA (mV) para ambos canales. Después de este ajuste, fijar el tornillo con el fijador del tornillo.

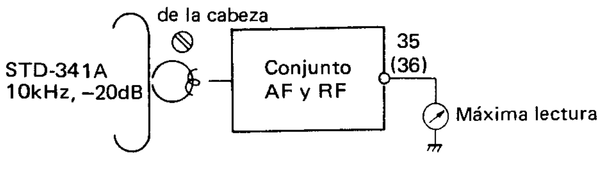


Fig. 13-8 Ajuste del azimut de la cabeza

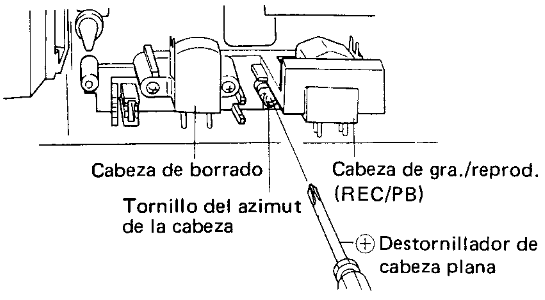

Cabeza de borrado
Cabeza de gra./reprod. (REC/PB)
Tornillo del azimut de la cabeza
⊕ Destornillador de cabeza plana

Fig. 13-9 Ajuste del azimut de la cabeza

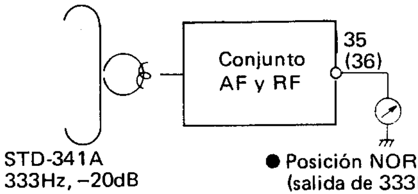
13.4.2 Ajuste del ecualizador de reproducción

Ajuste

Modo	Reproducción
Cinta de prueba	STD-341A (333Hz y 6,3kHz, -20dB)
Voltímetro de CA (mV)	no. 35 (canal izq.) y no. 36 (canal der.) del conjunto AF y RF

Procedimiento

1. Poner el selector TAPE SELECT en la posición "Norm". Reproducir la parte de 333Hz y de 6,3kHz de la STD-341A, y comprobar que la diferencia entre los dos niveles de salida no exceda de 0dB±1,5dB.
2. Luego poner el selector TAPE SELECT en la posición "Metal". Reproducir las partes de 333Hz y de 6,3kHz otra vez y comprobar que la diferencia entre los dos niveles de salida no exceda de -3,5dB±1,5dB.



- ● Posición NORM
  (salida de 333Hz)–(salida de 6,3Hz)
  $=0dB^{+1,5}_{-1,5}dB$
- ● Posición METAL
  (salida de 333Hz)
  –(salida de 6,3kHz)
  $=-3,5dB^{+1,5}_{-1,5}dB$

Fig. 13-10 Ajuste del ecualizador de reproducción

13.4.3 Ajuste del nivel de reproducción

Puesto que este ajuste determina el nivel de DOLBY NR durante la reproducción, deberá realizarse con precisión.

Ajuste

Modo .... Reproducción
Cinta de prueba STD-341A (333Hz, 0dB)
Voltímetro de CA (mV) .... no. 35 (canal izq.) y no. 36 (canal der.) del conjunto AF y RF.

Procedimiento

Ajustar el VR3 (canal izq.) y VR2 (canal der.) de modo que el voltímetro de CA (mV) indique -0,6dBv (0,93V).

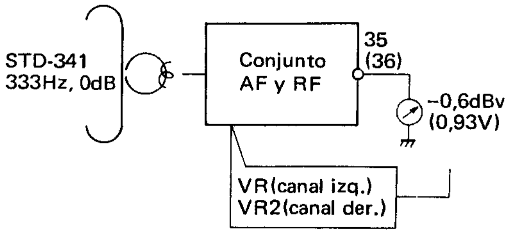

STD-341
333Hz, 0dB
Conjunto
AF y RF
35
(36)
–0,6dBv
(0,93V)
VR(canal izq.)
VR2(canal der.)

Fig. 13-11 Ajuste del nivel de reproducción

13.4.4 Ajuste del circuito trampa de polarización

Ajuste

Modo .... Grabación
TAPE SELECT .... Metal
Osciloscopio .... no. 44 (canal izq.) y no. 38 (canal der.) del conjunto AF y RF
Señal de entrada ...... Sin señal

Procedimiento

Ajustar L11 (canal izq.) y L12 (canal der.) de modo que el nivel de fuga de polarización sea el mínimo.

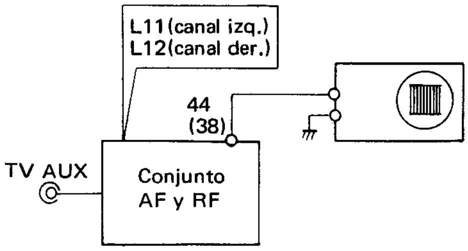

L11(canal izq.)
L12(canal der.)
44
(38)
TV AUX
Conjunto
AF y RF

Fig. 13-12 Ajuste del circuito trampa de polarización

13.4.5 Ajuste de la corriente de grabación

Puesto que el nivel es extremadamente bajo, tener especial cuidado en evitar el ruido de inducción exterior durante este ajuste.

Ajuste

Modo .... Grabación
Voltímetro de CA (mV) .... no. 35 (canal izq.) y no. 36 (canal der.) del conjunto AF y RF
Señal de entrada ...... 333Hz aprox. - 8dBv (400mV) a los terminales TV/AUX

Procedimiento

1. Ajustar el atenuador de modo que el voltímetro de CA (mV) indique - 2,2dBv (0,775V).
2. Conectar el cable de conexión provisional entre los terminales no. 72 y 76 del conjunto del bloque de OSC. Luego conectar el voltímetro de CA (mV) entre los terminales no. 25 y 31 (canal izq.) y también entre los terminales no. 28 y 30 (canal der.) del conjunto AF y RF.
3. Ajustar el VR7 (canal izq.) y VR8 (canal der.) de modo que el voltímetro de CA (mV) indique - 66dBv (0,5mV).
4. Desconectar el cable de conexión provisional.

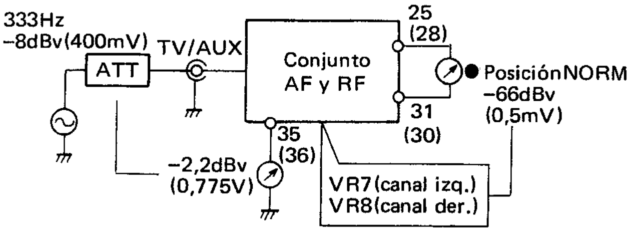

333Hz
–8dBv(400mV)
TV/AUX
ATT
Conjunto
AF y RF
25
(28)
● PosiciónNORM
–66dBv
(0,5mV)
31
(30)
35
(36)
–2,2dBv
(0,775V)
VR7(canal izq.)
VR8(canal der.)

Fig. 13-13 Ajuste de la corriente de grabación

13.4.6 Ajuste de la polarización de grabación

El ajuste preciso de la polarización de grabación se realiza en la sección 13.4.7 Ajuste de la respuesta en grabación/reproducción.

Ajuste

Modo .... Grabación
Voltímetro de CA (mV) .... Entre los terminales no. 25 y no. 31 (canal izq.) y no. 28 y no. 30 (canal der.) del conjunto de AF, RF
Señal de entrada ...... Sin señal

Procedimiento

Ajustar el VR5 (canal izq.) y VR6 (canal der.) del conjunto del bloque OSC de modo que el voltímetro de CA (mV) indique 3,3mV.

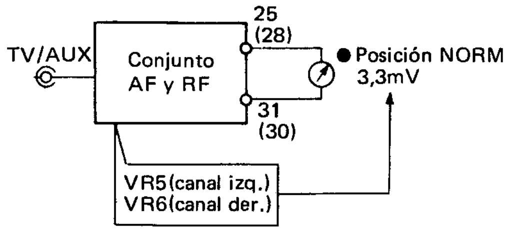

25
(28)
TV/AUX
Conjunto
AF y RF
● Posición NORM
3,3mV
31
(30)
VR5(canal izq.)
VR6(canal der.)

Fig. 13-14 Ajuste de la polarización de grabación

13.4.7 Ajuste de la respuesta en grabación/reproducción

Ajuste

Modo	Grabación/reproducción
Cinta de prueba	STD-608A
Voltímetro de CA (mV)	no. 35 (canal izq.) y no. 36 (canal der.) del conjunto AF y RF
Señal de entrada	333Hz aprox. - 33dBv (22,4mV) a los terminales TV/AUX
Selector de función	TV/AUX

Procedimiento

1. Ajustar el nivel de la señal de entrada con el atenuador de modo que el voltímetro de CA indique - 27,2dBv (43mV).
2. Grabar las señales de 1kHz y de 10kHz en la STD-608A.
3. Reproducir la cinta y ajustar el VR5 (canal izq.) y VR6 (canal der.) de modo que la diferencia entre las dos salidas sea de 0dB± 1dB a 10kHz.

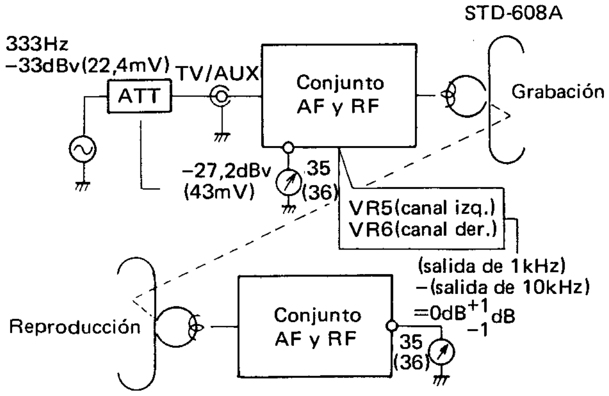

STD-608A
333Hz
-33dBv(22,4mV)
TV/AUX
ATT
Conjunto
AF y RF
Grabación
-27,2dBv
(43mV)
35
(36)
VR5(canal izq.)
VR6(canal der.)
(salida de 1kHz)
-(salida de 10kHz)
=0dB+1 -1 dB
Reproducción
Conjunto
AF y RF
35
(36)

Fig. 13-15 Ajuste de grabación/reproducción

13.4.8 Ajuste del nival de grabación

Puesto que este ajuste determina el nivel de DOLBY NR durante la grabación, deberá realizarse con precisión.

Ajuste

Modo	Grabación/reproducción
Cinta de prueba	STD-608A
Voltímetro de CA (mV)	no. 35 (canal izq.) y no. 36 (canal der.) del conjunto AF y RF
Señal de entrada	333Hz aprox. - 18dBv (125mV) a los terminales TV/AUX

Procedimiento

1. Ajustar el nivel de la señal de entrada con el atenuador de modo que el voltímetro de CA (mV) indique - 12,2dBv (245mV).
2. Grabar las señales de 333Hz en la STD-608A. Reproducir la cinta y ajustar el VR7 (canal izq.) y VR8 (canal der.) de modo que el voltímetro de CA (mV) indique - 12,2dBv (245mV).

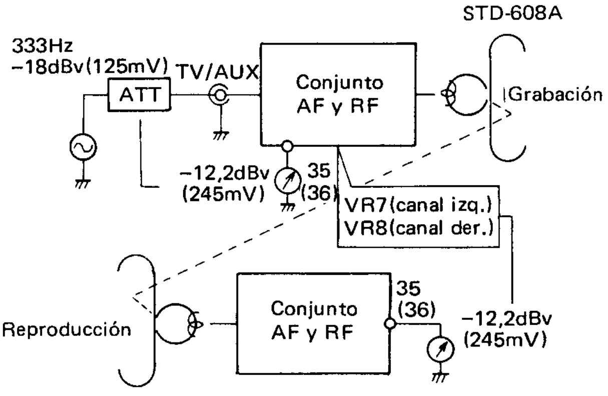

STD-608A
333Hz
-18dBv(125mV)
TV/AUX
ATT
Conjunto
AF y RF
Grabación
-12,2dBv
(245mV)
35
(36)
VR7(canal izq.)
VR8(canal der.)
Reproducción
Conjunto
AF y RF
35
(36)
-12,2dBv
(245mV)

Fig. 13-16 Ajuste del nivel de grabación

13.4.9 Ajuste del sistema DOLBY NR

Ajuste

Modo	Grabación
Voltímetro de CA (mV)	no. 35 (canal izq.) y no. 36 (canal der.) del conjunto AF y RF
Señal de entrada	2kHz, - 28dBv (40mV) a los terminales TV/AUX
Selector de función	TV/AUX
VR4	Posición central

Procedimiento

1. Ajustar el nivel de la señal de entrada con el atenuador de modo que el voltímetro de CA (mV) indique - 22,2dBv (77,5mV).
2. Luego conectar el voltímetro de CA (mV) entre el terminal no. 47 del conjunto AF y RF y masa. Después poner el interruptor DOLBY NR en la posición ON.
3. Ajustar el VR4 de modo que el voltímetro de CA (mV) indique - 17,9dBv (127mV).

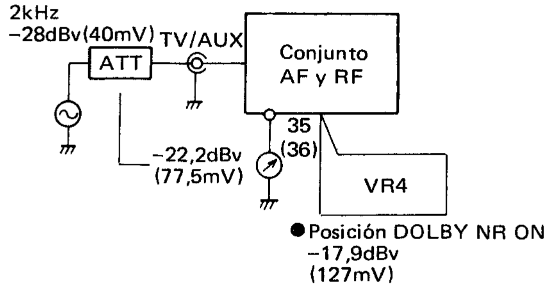

2kHz
−28dBv(40mV)
TV/AUX
ATT
Conjunto AF y RF
35
(36)
−22,2dBv
(77,5mV)
VR4
●Posición DOLBY NR ON
−17,9dBv
(127mV)

Fig. 13-17 Ajuste del sistema (DOLBY NR)

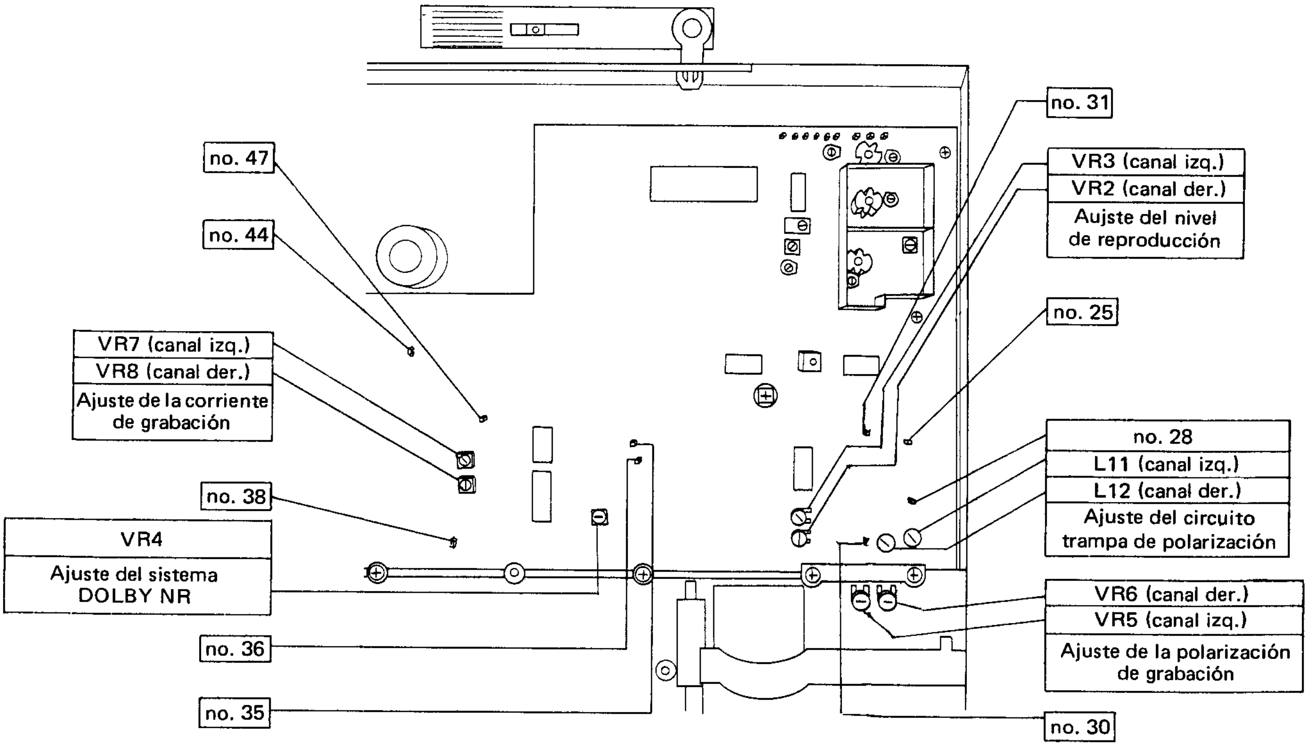

no. 47
no. 44
VR7 (canal izq.)
VR8 (canal der.)
Ajuste de la corriente de grabación
no. 38
VR4
Ajuste del sistema DOLBY NR
no. 36
no. 35
no. 31
VR3 (canal izq.)
VR2 (canal der.)
Aujste del nivel de reproducción
no. 25
no. 28
L11 (canal izq.)
L12 (canal der.)
Ajuste del circuito trampa de polarización
VR6 (canal der.)
VR5 (canal izq.)
Ajuste de la polarización de grabación
no. 30

Fig. 13-18 Puntos de ajuste y de medición